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GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and facilities for such dispatch.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:

Mondays to Fridays 9.30 a.m. till 5.30 p.m.

The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

British Interests in Argentina

THE British Foreign Office in a statement issued recently, in which was announced a further agreement to purchase Argentina produce, indulges in some unusually blunt speaking. In the course of the announcement it was stated: "His Majesty's Government expects that the rights and interests of British nationals in Argentina will receive in the future all proper consideration and protection." That is equivalent to saying, in as strong language as diplomatic usage permits, that the treatment accorded to British interests latterly has not reached the standard which is expected. The declaration has been welcomed, and is expected to strengthen the hands of the mission of directors of British-owned railways in the Argentine which is visiting that country to look into the parlous position into which the railways have sunk, largely as the result of the unsympathetic treatment they have received. The British-owned railways, indeed, provide the outstanding instance of the lack of "all proper consideration and protection" at the hands of the Argentine Government. The reply received from the Argentine Government did not hold out much hope of improvement in the conditions meted out to British interests. It was phrased in quite general terms and confined such assurances as it gave to damage resulting from measures taken recently to maintain public order.

Increased Rates to be Maintained

Almost simultaneously with the statements of the two Governments, a Presidential decree was issued in Buenos Aires authorising the foreign-owned railways in Argentina to maintain until June, 1944, the increased tariff rates authorised in March, 1942. The decree of March, 1942, sanctioned an increase of 5 per cent. in fares, and of 10 per cent. in goods rates, and was renewed for a further period of six months last March. The concession confers little benefit on the railways, however, as a major part of the increased revenue has to be devoted to the suspension of wage-cuts and to pension fund obligations. It was for this reason, coupled with higher operating costs, that British-owned railways in Argentina in January this year asked for an additional increase of 20 per cent. on goods, livestock, and parcel rates, and of 10 per cent. in passenger and luggage tariffs. This request was rejected by the Argentine Government, which authorised a 3 per cent. increase in rates, but again stipulated that the proceeds should go to the workers' fund, and also that a 2 per cent. special tariff was to be devoted to a married workers' fund.

Taxpayers Their Own Taxgatherers

In the recent debate on manpower in the House of Commons several members suggested that part at least of the nation's needs for men and women power could be satisfied by a comb-out of Government departments, and some figures were given relating to increases which had taken place in the staffs. Mr. Assheton, Financial Secretary to the Treasury, said that the total increase in the number of non-industrial Civil Servants was from 400,000 in April, 1939, to 730,000 at the present time. Some members objected that the increase in Civil Service staffs had begun before 1939. In our view, Mr. Assheton was unfortunate in the example which he gave of the growth in staffs. He selected the Board of Inland Revenue, and said that during the war the number of taxpayers in this country had risen from 4,000,000 to over 12,000,000, and added that the Inland Revenue Department "by very great and sustained efforts has succeeded in handling its enormous increase in business with only a 50 per cent. addition to its pre-war staff." Inasmuch as a very great deal of the work formerly performed by the Inland Revenue Department is now undertaken by business organisations under the scheme whereby tax is deducted from wages and salaries at source, with a corresponding great increase in the work performed directly by industrial organisations on behalf of the Treasury, which incidentally meets no part of the cost, the 50 per cent. increase in the Board of Inland Revenue staffs still seems to us to be large.

Government Oracles

Those who seek guidance as to Government policy in the public utterances of members of the Government may be excused if sometimes they are a little puzzled. On September 30, Mr. Herbert Morrison, the Home Secretary, told a Labour Party meeting that the country in its present mood preferred the virtues of socialism to those of private enterprise. The war had taught people that there were very real virtues in the exercise of public authority over economic and social affairs, and they would not be unresponsive to well-informed practical proposals for public control. On the same day Sir Walter Womersley, Minister of Pensions, told the resumed conference of the National Chamber of Trade: "Some people think we are drifting

towards nationalisation of this and that, but my view is that although the people of the country have to endure restrictions and control now, they are so sick and tired of them that they will want them cleared away as rapidly as possible after the war." He thought that the people would revolt against anything that increased control of individual effort, and he urged that there should not be too great a hurry to remove all restrictions. It seems to be quite clear that, in this country at least, freedom of speech and conviction are still unrestricted.

A Lesson from the Coal Industry

The recent disturbances to production in the coal industry, the prevalence of localised stoppages of work, the fall in output, and the disinclination of certain of the workers to accept awards of properly constituted tribunals, are not good arguments for those who have for so long advocated the nationalisation of the coal-mining industry. If it were to come about, it seems likely that a good deal of the time of Parliament would be taken up in running the industry. As to production, one has only to look at the experience gained during the period of Government control during the last war to form an opinion on efficiency. In 1914, the output of saleable coal per person, per shift, was just over 20 cwt. During the period of Government control it fell steadily until it was rather less than 14½ cwt. By the beginning of the present war it had been brought up to over 23 cwt. but now it is understood to be about 20 cwt. Between the two wars an ascertained figure of £107,000,000 had been spent by the industry on mechanisation, modernisation, and the preparation of coal for the market, exclusive of sums spent in the sinking of new pits. The last term of Government control of the industry cost the nation about £1,000,000 a week. The lessons in relation to the proposals which are sometimes made for the nationalisation of the railways of this country are too obvious to need stressing.

The Future of the Railways of Rhodesia

It has been announced that the Government is to appoint a commissioner to investigate a proposal made by the Southern Rhodesia Government for the Governments of Southern Rhodesia, Northern Rhodesia, and the Bechuanaland Protectorate, to obtain control of the railway system in their territories. A commissioner has been appointed because the proposal raises important financial and economic issues, and the British Government does not feel that at present it is in possession of sufficient information to form a final opinion. Reuters reports from Salisbury that a Bill extending for a further twelve months the 1941 legislation for Government control of the railway system is to be introduced by the Rhodesian Government at the next sitting of Parliament, and that during the year it is hoped that the commissioner will have completed his investigations. The statutory authority to assume a form of control over the railways of Southern Rhodesia, Northern Rhodesia, and the Bechuanaland Protectorate took effect early in 1927. As a result of further discussions between the Governments and the railway company, the Rhodesia Railways Limited, amending legislation was enacted in 1935 and again in 1941. Rhodesia Railways Limited is controlled by Rhodesia Railways Trust Limited, which in turn is controlled by the British South Africa Company. It operates some 2,445 miles of railways, all of 3 ft. 6 in. gauge.

Railway Research in Wartime

The urge to "get on with the war and let everything else wait" has often been used, during the past three or four years, to justify a slackening, if not a halt, in all experiment and research other than that which bears directly on the war effort. For various reasons, however, this is a mistaken view; and, despite the limitations imposed by wartime conditions, especially in personnel, the railways cannot afford to neglect this side of their work. The technological advances that have been made in many realms to meet war needs have been rapid and revolutionary; decades of peacetime research might well have been needed to bring them about. Their effect on the competitors of the railways, on the sea, on the roads, and, above all, in the air, will lead to unpredictable advances in the efficiency of these competitive methods of transport; and if the railways are not ready, when the war is ended, to adapt such developments to their own uses, they will soon be lagging well behind in the race. As our American contemporary, the *Railway Age*, comments, "There is a traditional tendency on the part of many to make changes reluctantly, and to adopt them only after they have been proved by extensive service on other roads. Some of the developments resulting from the war will have 'service records' of their own, made under gruelling combat conditions—conditions in many instances more severe than would be required in railway service. In such instances it may reasonably be asked why it

should be necessary to conduct further exhaustive trials and service tests on the railways before taking advantage of them."

The Madeira-Mamoré Railway

Steps are being taken by the Brazilian Government to rehabilitate the 227 miles of the Madeira-Mamoré Railway, which was built to bring down rubber from the upper Amazon forests to the river. Construction was attempted by United States, British, and French engineers in succession from 1870, but the difficulties were so great that not until 1907, when the Amazon rubber boom was nearing its peak, was the work taken seriously in hand mainly by United States engineers, and labourers from the Panama Canal region and the U.S.A. The line opened in 1913, just too late to tap the maximum business, and the dwindling of the Amazon rubber trade resulted in the line falling largely into disuse. The present demand for rubber has completely altered the position, and Brazilian engineers lately have been doing wonders in putting the railway again into running order. Of fourteen locomotives, ten are now usable and three are in course of repair. Work done on the spot in the repairing of rolling stock included the making of castings and forgings, and welding. A steel-framed warehouse is being built of old frames and steel sections. Sleepers have been imported, as it was impossible to obtain suitable timber locally.

Rolling Stock and Rail Wear

Railway engineers who are responsible for the maintenance of permanent way are becoming by degrees more thoroughly awakened to the shortening of the life of track, and of rails in particular, that may result from external damage. Among the causes of such damage one of the most prevalent, and the most harmful in its effects, is the slipping of locomotive driving wheels; not a few cases have occurred in which a single bad slip has compelled the withdrawal of a pair of rails as a result of damage to the running surface. Skidding of wheels due to unduly severe braking can cause wheel burns and corrugation; flats on tyres and badly-balanced locomotives are harmful because of the shocks that they impose on rails, track, and underline structures. On their part, permanent way engineers have done their utmost, by closer attention to line, surface, and gauge, to packing of joints, to the use of rail-oiling devices to minimise wear on curves, and in other ways, to prolong rail life. In America further measures taken have included the application of oil to rails and to rail-joints to minimise corrosion, extensive rail-end hardening and building up of running surfaces at joints by welding, and efforts to increase the stability of the roadbed and track structure generally, in order to relieve the rails of all unnecessary stresses. Now, and justifiably, as our contemporary the *Railway Age* comments, "maintenance officers look to operating officers to view the rail problem with equal concern, and to intensify their efforts to minimise rail damage by restricting the speeds of locomotives to those for which they were designed, and by preventing the unnecessary slipping of driving wheels."

Flange-Oiling on Curves

Of many devices used to effect economies in railway track maintenance, few have paid more substantial dividends on a relatively trivial first cost than the flange oils now used on curves. In the United States, with far heavier axle-loadings and train loads than in Great Britain, and—on some of the lines carrying the heaviest traffic, such as the major coal-carrying routes through the Alleghenies—sharper and more continuous curvature than on British main lines, the merit of flange lubrication as a potential source of economy in steel consumption is so widely recognised that the War Production Board has made a point of seeing that manufacturers making these flange oils are kept adequately supplied with materials. It is now reckoned that flange lubrication prolongs the life of the high rail on curves from two to four times, and that, as additional advantages, it reduces the re-gauging and relining of curves otherwise necessary, so prolonging the life of sleepers, reducing the wear of flanges, permitting higher speeds over curves with safety, and even allowing higher tonnage ratings. It is on record that one American railway was able to excise from its permanent way maintenance budget an item of \$1,000 a month for transposing rails at one of its large terminal stations as a result of having installed 13 flange lubricators.

Double Quadrant Signals in Germany

Early in signalling development in Germany the upper quadrant semaphore became the standard and several countries associated with Germany followed suit. From time to time however, proposals were made to use the lower quadrant position

for certain purposes. In Holland it had been adopted to distinguish a distant arm at caution from a stop signal arm at danger; the 45 deg. upward position was the clear aspect for both. With the adoption of the principle of indicating speed rather than route the question of finding a substitute for the two-armed German junction signal with concealed arm again came to the fore, and experiments were made with a 3-position semaphore which, when inclined downwards, indicated a speed restriction. About the beginning of the present war it was announced that this signal was being installed on the Berlin-Hamburg and Berlin-Breslau routes. Red and green are used as night aspects for the stop and clear indications and flashing yellow for the lower quadrant reduced speed indication. Semaphores working in both quadrants have been used as train order signals by a few American lines.

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A Spanish Locomotive Forecast

Writing in *Ferrocarriles y Tranvías* regarding the future of steam locomotive development in Spain, Señor Martínez de Velasco expresses the view that increased horsepower per ton will be most conveniently obtained by concentrating on three types. For passenger locomotives he recommends the 2-8-0 wheel arrangement with an adhesive weight of 80 tons, a total weight of 95 tons, and an output of 3,000 h.p. This power should be obtainable with a grate of little more than 4 sq. m. in area which could be accommodated between the two rear axles. Possibly a Kraus bogie would have to be employed to avoid unduly increasing the wheel diameter. The 2-10-0 type is recommended for mixed traffic work. Here the adhesive weight would be 100 tons and the total weight 115 tons; the output would be 3,500 h.p. In the author's opinion this locomotive, apart from weight distribution, would present fewer difficulties in design than the first mentioned. With tender locomotives it is difficult to obtain a specific horsepower of less than 30 per ton of adhesive weight, and this the author considers excessive. However, he sees a possibility of developing a 2-10-0 design developing about 27 h.p. per ton of adhesion. As in Italy, it might be possible to load the engine with some of the water and fuel normally carried on the tender.

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The Rebuilding of a Famous Locomotive Class

In nature the phenomenon of metamorphosis produces some revolutionary changes in the appearance of creatures that must remain fundamentally the same throughout their lives; locomotive rebuilding leads to alterations no less remarkable, so that in these pages we have frequently had occasion to describe conversions that make the original design almost unrecognisable. Most drastic of all are the changes which result from converting a tank engine into a tender one; this, however, is not a very common alteration; the usual way in which locomotives lose their characteristic features is by acquiring new boilers. Almost invariably a new boiler has a different diameter and carries an altered style of chimney and dome. Of famous engines fated to take on a new appearance, mainly as the result of a new boiler, the latest example is the L.M.S.R. "Royal Scot" class, built in 1927 and 1930. On page 361 of this issue is a description of conversion work due to be carried out; a view of converted engine No. 6103, "Royal Scots Fusilier" shows that a second look will be required henceforth to distinguish a "Royal Scot" from engines of a later breed.

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Ensuring Punctuality on the C.N.R.

Punctuality is a vital factor in railway operation. A note published in these columns on January 29 drew attention to the importance attached to the accuracy of railway watches in the United States of America, where they play a large part in the dispatching system; and mention was made in our August 20 issue of the steps taken by the London Passenger Transport Board to maintain and check its timepieces. In the new Central Station of the Canadian National Railways at Montreal, sixty-two electrically-operated clocks, synchronised with a master clock which operates eight machines each in control of a circuit, serve the staff and public. To provide for emergencies, there is a battery system maintained by a trickle-charger, which could furnish electrical impulses to operate all the clock-motors for at least three days. All C.N.R. station and headquarters clocks are regulated from McGill University Observatory, and are checked daily through a special telegraphic circuit. Master clocks throughout the system are used to check the watches of railwaymen concerned in the movement and operation of trains, of whom there are more than 17,000; each is required to have his watch checked twice monthly by one of the company's 250 watch-inspectors.

The Future of Transport

THE wide publicity in the national press which has been accorded the publication of the booklet* containing the reprint of a series of editorial articles recently published in *The Railway Gazette*, dealing with the future of transport, is a measure of the current interest which is being taken in all quarters in a problem which, it is realised affects not only the various units of the transport system of the country, but the well-being of the nation itself. There is ample evidence from the published notices which have appeared that responsible opinion is eagerly seeking a basis for the formulation of policy in relation to transport, and the views which have been put forward in relation to the articles in the principal organs of the national press are worthy of more than passing note.

The Times, which devoted the major part of its City article to the booklet, pointed out that the reader will look in vain in this pamphlet for a cut and dried scheme for the organisation of transport after the war, but that he would find an analysis of the circumstances in which any scheme would then have to operate, and some suggestive answers to the question: "What are we then going to want of transport?" It adds that if Sir James Milne's foreword to the pamphlet really interprets what the railways want—it points out that incidentally this must be the first public indication of the lines on which the managements are thinking about post-war—they are still thinking about "the square deal." In relation to the "square deal," *The Times* says that even four years ago the recommendations of the Transport Advisory Council had all the appearance of a temporary palliative and not a final solution; today they might work a little better than they promised to do then, because road transport has now gained some of the integration that it then lacked. They still fail to meet what appears a fundamental difficulty. The present railway rates structure was developed under conditions of a monopoly of goods transport. That monopoly has now gone. In theory this situation could be met either by abandoning the present rate system for a system of competitive quotations, or, alternatively, by re-creating the monopoly in agreement with road transport. In fact, neither solution is practical politics. The railways would never be able to afford to charge low rates for low-grade traffics (the war has not altered industry's dependence on this system) unless they are able to charge higher rates for the higher-grade traffic. Public opinion would certainly not countenance the prospect of the re-creation of a close private monopoly of goods transport. Only some system which would bring road transport (and presently internal air transport) into a flexible controlled rate schedule which would give the best correlation of road with rail, and of road and rail with air services, is likely to offer a permanent solution. Commenting that the author of the booklet, who refrains deliberately from a sketch of any particular scheme, would like "an immediate inquiry started in an endeavour to set out the principles of a common charging structure (or structures) for all forms of transport, *The Times* City Editor says that this is indeed the first line of approach towards any long-term plan.

The Manchester Guardian says that the author is more concerned to submit facts and arguments for further study than to make concrete proposals, but this reticence makes the publication all the more useful to those who are tired of generalities in these transport discussions and want to get down to brass tacks. Although this challenge comes from the railway camp, its principal demand is for the planning of transport as a whole. The assumption is, no doubt, that this would help, or at least preserve, the railways, but that is no reason for throwing cold water on the proposition. Referring to the recent remark of Mr. Noel-Baker that there will be a plan for new motor roads after the war, the newspaper states that motor roads should not be considered in isolation; in broad national decisions the way in which new trunk roads would affect other means of transport should be considered at the outset.

The Daily Telegraph City Editor says that all who are interested in the future of British transport, including the vast army of railway stockholders, will find food for thought in the pamphlet. The foreword by Sir James Milne, Chairman of the Railway General Managers' Conference, invests this study with an authority which is also apparent from the text. The basis of approach to the problems involved, will command approval over a wide field. There is abundant proof in the pre-war and war-time achievements of British transport that private ownership and management have been consistent with efficiency and progress.

The News Chronicle City Editor expresses his agreement with the author of the articles in his view that it has been shown that the effective control of an undertaking as susceptible to ups and downs

* "The Future of Transport," June 18; "The Problem of the Peaks," July 9; "Transport and its Track," July 23; "Transport and Full Employment," August 20; "Transport and Catering Policy," August 27; "Post-War Transport: A Plan to Secure Economy and Efficiency," September 3, reprinted as a pamphlet, "A National Transport Programme," price 1s., *The Railway Gazette*, 33, Tothill Street, London, S.W.1

as railway enterprise cannot be removed from those who shoulder the financial risks, and that the alternative is between outright nationalisation (*via*, if desired, a public corporation fortified by Treasury guarantee) and continuance of the present private ownership. The unsatisfactory experience of Transport "C" stock ought not to be repeated. To draw the appropriate line between co-ordination and free enterprise will be a very delicate task, and the City Editor of the *News Chronicle* says that perhaps the writer of the articles will try his hand on it in a future series of articles.

The Glasgow Herald says that much of the material will be found controversial, but the thesis of the first article is simply that the existing divorce between ownership and control must be reduced, and not exaggerated, and with this few people with a sense of justice will quarrel.

The Financial Times in a leading article declares that it did not need the incidence of war to point the necessity for some remodelling or co-ordination of transport systems, not only in this country, but throughout the world. New problems have arisen with the development of road transport, and this war's stimulus to aerial progress will add one more to the number of major factors which must be taken into account. The war has made more urgent the need for a solution, but it still remains to find the best method of approach. The series of articles reprinted from *The Railway Gazette* is concerned with just this point. The foreword by Sir James Milne shows clearly enough that railway circles are still looking forward to the implementation of "square deal" principles. Their claim to such improved treatment has been enormously strengthened during the war. The contention that "the railways are indispensable" can scarcely be disputed in the light of the events of the last four years, as they have affected us in this country. The retention of a first-grade railway system is a national need. It requires that the railways must be able to make a reasonable living, and not be endangered by having the cream of the most remunerative traffics skimmed off by their rivals. It is not that the railways are at a disadvantage in operating costs—it is claimed that "the railway is the cheapest form of traction ever invented," and *The Financial Times* goes on to quote comparisons of costs between the privately-owned railway track and the publicly-owned highway. It concludes that the highest efficiency of service to the public, which must be the ultimate goal, demands that each form of transport shall be in a position to give the best of which it is capable.

The Financial News welcomes the reprint "of a number of forward-looking articles," and states that it would be interesting to have a sequel to this book, giving the bones and flesh of the co-ordination plan, which was finally suggested but not given in detail.

The City Editor of *The Sunday Times* says that the investor in the home railway junior stocks would be well advised to read the pamphlet. He may not be entirely reassured, for the pamphlet argues that if the railways are handed over to a Public Board the investor will bear all the risk and have no power of control, but at least he will learn that railway opinion is thinking, not in terms of one form of transport, but transport as an indivisible whole.

Fuel Economy on the Railways

THE railways were among the first of the major industries in this country to appreciate the need for strict economy in the use of fuel, and to take practical steps to achieve that end. Long before the present stringency of fuel supplies, continuous efforts were being made to obtain the maximum efficiency from every pound of coal used, and to avoid waste. When the Minister of Fuel & Power addressed a very widely representative gathering of railwaymen on September 29, to urge the need for increasing economy in the use of fuel, he was preaching not only to the converted but to those who had behind them the years of experience in the best methods by which his problem could be attacked. As users of some 16,000,000 tons of coal a year, and large quantities of gas, electricity, and oil fuel, the railways have had to practise economy for the sake of their own budgets, and Mr. M. G. Bennett, Chairman of the Railways Fuel Economy Committee, as recorded on page 368, was able to give the Minister some striking instances of the successes which have been achieved in this direction. The Minister was assured of the continued co-operation of the railways in taking all possible steps to reduce the consumption of fuel, and in the meetings which are shortly to take place throughout the country, there can be no doubt that the examples quoted by Mr. Bennett will be acted on, and that railwaymen in all grades will be stimulated still further to reduce the calls made by their industry on the coal resources of the nation.

As an example of some of the achievements which have been

made before the war in the better use of coal, may be cited the fact that the reduction in the consumption of coal per engine mile between 1923 and 1938 was such that on the basis of the 1923 figure 600,000 tons more coal would have been needed in 1938 than was the case. Again, there have been continuous efforts to plan the working of engines so as to avoid idle time in steam, with the result that one railway alone, with a stock of less than 8,000 locomotives in 1938, was carrying more traffic than it was in 1923 when it had more than 10,000 locomotives. The major problem of effecting fuel economy on the largest scale must remain that of driving trains with the least possible amount of coal, and the key to this must be found in skill on the foot-plate. Mr. Bennett gave some examples of how the railways were tackling this problem, and he pointed out that, in large part, it must depend not only on the training and encouragement they receive, but also very largely on how keen were the men themselves to help in this urgent war job. Much has been done by the railways to stimulate intelligent enthusiasm among the staff; to this end fuel watchers have been appointed to a number of some 15,000, and these supplement the work of the thirty full-time fuel economy officials, and of the inspectors, foremen, and others whose normal duty includes the prevention of waste in any form. A joint Railway Fuel Economy Committee has been set up, and has had many fruitful discussions. The conferences which are to be held during the coming winter will be devoted to specific subjects, such as locomotive firing, manufacturing works practice, and so on, and will be made really representative by bringing together all ranks in the railway service, from eminent engineers to boiler-house men. It is intended to take steps to make public the practical suggestions and advice which will no doubt result from these discussions.

Half a Century in American Signalling

MUCH has been written, during the last thirty years or so, on railway signalling practice in the United States, but it is contained for the most part in back numbers of American technical journals and books now out of print, with the result that it is difficult for the English student of the subject to obtain a clear picture of the development of railway signalling on the other side of the Atlantic. Signal engineering has been the subject of considerable thought, inventive genius, and manufacturing skill in America and its development has been governed by the circumstances in which the railways there have to operate. A most interesting light on American practice has been provided recently by a contribution to the *Journal* of the Institution of Railway Signal Engineers from Mr. A. H. Rudd, who retired a few years ago from the position of Chief Signal Engineer of the Pennsylvania System, after spending half a century in signal engineering on some of the most important railways of America. The railway system in the United States, he said, rapidly expanded and a large number of companies came into existence, but there was little technical co-operation between them for some years, and signalling and operating principles and practice varied noticeably between the different lines. The benefits of interlocking and the space interval principle were recognised early, but their application was inevitably slow and for some years only the most prosperous railways were able to adopt signal apparatus extensively. Many types of signal and signal aspect came into use. At an early stage, attention was directed to the production of automatic-signalling apparatus, and the track circuit was developed and installed in America on a comparatively large scale before it attracted any great attention in Great Britain.

Although mechanical signalling was eventually installed all over Great Britain, it suffered some modifications of detail in America, and was never universally adopted. Power signalling attracted attention and was developed in several forms, which were tried at some of the large stations and gradually achieved deserved success. The task complementary to this, the development of reliable automatic signalling, was also ably attacked and accomplished, and both exercised considerable influence on practice in this country and elsewhere, particularly in the field of electric railway signalling.

The Pennsylvania Railroad operated for many years part of its system under the name of Pennsylvania Lines West. Early this century the Lines West had, under their signal engineer, Mr. W. M. Grafton, adopted the three-position motor-operated automatic signal with success, but the Pennsylvania Railroad had as yet adhered to home and distant aspects, and favoured electro-pneumatic working. About forty years ago serious attempts were made to initiate a movement in favour of standardising the practice on the west and east lines, but for some time little progress was made, notwithstanding that a favourable

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report had been presented by the two signal engineers, but eventually, in 1905, Mr. Rudd and the late Mr. F. Rhea, then in the engineering department of the Lines West, were commissioned to make a thorough investigation and draw up recommendations for a uniform system of signal aspects and methods of working. Its influence on Pennsylvania practice, and in due course on that of some other lines, was soon noticeable, and although even today there are many differences between the signalling arrangements of the leading railways, such standardisation as has been attained is largely traceable to the report, especially in the matter of the upper-quadrant semaphore and the use of speed-signalling indications. It is of interest to note that the report held illuminated semaphore arms to be the ideal arrangement. Unsuccessful experiments had been made with some as early as 1888, but when the suburban lines round Philadelphia were being electrified in 1915, Mr. Rudd was able to realise the idea in the form of the position—originally called beam—light signal, in which rows of uncoloured lights represent a semaphore in its various positions. This signal has since become the Pennsylvania standard and has found its way to one or two other lines, and in Europe it is seen as a shunt signal, and in Great Britain also as a junction indicator. About five years before the production of this type of signal the Pennsylvania had installed colour-lights in connection with the

Hudson River tunnel and New York terminal work. Some unexpected difficulties were encountered with the first position-light signals but eventually they were all successfully overcome. In a paper he read before the Institution of Railway Signal Engineers in 1914, Mr. Rudd outlined the first proposals for these signals and for inductive cab signalling, now such a feature on the Pennsylvania main lines.

The production of the best materials for relay cores and contacts, for rail bonds, rail joints, rod insulation, wires, battery elements; the design of signal-operating mechanisms, before day coloured lights became practicable, and of the all-important lightning arresters, were tasks which occupied the designers of automatic signalling equipment for many years. Their perseverance was rewarded, however, and they found, too, how to prevent extraneous currents influencing the apparatus and how to make the track circuit safely applicable to electrified lines, both indispensable to the final success of their efforts. From the days of the simple battery track circuit and clockwork or "banjo" signals to the latest refinements of the art, such as coded track circuit, cab-signals, and centralised control, is a fascinating story which it would take a volume to relate in the manner it deserves, but Mr. Rudd's historical notes enable the British reader to appreciate something of the American achievement.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Bifurcating Scales for Railway Rates

September 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The principle Mr. Gibb enunciates in your September 24 issue is in practice an old one, and the only new element lies in its presentation. In their practical day-to-day work, rates clerks frequently give exceptional rates the same in amount between the same points, or over equal distances, for traffics which vary widely in the railway classification. The aim of the rate-maker is to secure the maximum net receipts, and although the railway rates structure is founded on 21 standard scales, each of which progresses by different amounts per ton mile, the exceptional rates are commercial figures which are intended either to increase national production or consumption, or to secure traffic to rail which would otherwise pass by another mode of transport.

There is a great deal to be said for combining standard rated and exceptionally-rated traffics into a series of common mileage scales. If this were done it would be advisable both in the interests of industry and of railway receipts that such scales should be simple, and based not on idealistic curves, but on the realities of present-day (i.e. pre-war) charging, thus reflecting actual commercial figures.

Yours faithfully,

MALLER

What is Private Ownership ?

October 4

TO THE EDITOR OF THE RAILWAY GAZETTE.

SIR,—In one sense, Cross Bencher's letter in your issue of October 1 performs a useful service. I had suggested in the second of my articles on the future of transport that the relationship of ownership to management raised issues of first-rate importance that could not be too widely discussed in connection with the post-war plans. In another sense, it is unfortunate that his letter particularises the L.P.T.B. I said in the second of the articles that "the L.P.T.B. problem was simplified by co-ordinated public transport arrangements in London. No one who looks at the problem objectively can doubt that." This referred of course to the general arrangements and not to the set-up of the board.

However, to take up Cross Bencher's main point. The argument here is on the meaning of "owner," with particular reference to the L.P.T.B. I agree at once that in that case the stockholders do not own the assets; these are vested in the board; and the board is not answerable to the stockholders. In the discussions leading up to the establishment of the board, it was originally intended that the "A" stock would correspond mainly to debenture issues, the "B" stock mainly to preference issues, and the "C" stock to ordinary issues. But the ordinary stocks became converted into a fixed-interest stock, carrying an obligation that the board so far has not met in full. Cross Bencher suggests there is nothing novel in the L.P.T.B. arrangement. Let its creator—Mr. Morrison—speak for himself. In the House of Commons on November 17, 1937, referring to the L.P.T.B., he said:—

"The essential and most revolutionary provision of the Bill was retained, and that was that the Bill took away the ownership of the undertaking

from the existing owners, and did not give them the right to cash in compensation, but compulsorily gave them paper. It abolished the right of the shareholders to elect the directors and only gave them a certain right to apply for a receiver in certain circumstances, which they will be very careful about exercising. Never before had Parliament compelled capitalists to take paper in compensation for an undertaking and denied them a voice in the election of directors."

Need anything more be said as to the L.P.T.B. parallel ?

As to Cross Bencher's views on London Transport stock, these can well be matched by the following extract from an article in the *Economist* of October 2 on "ownership and control":—

"Since most of these enterprises are owned by the investing public, the question arises of what the investor's position is to be. One solution has been tried in the case of the London Passenger Transport Board. There the 'C' stockholders carry any loss that may be made, but the upper limit of their receipts is fixed and they have no control whatever over the board, except the entirely illusory one of the right to appoint a receiver. Effectively, the board is responsible to no one, and, whatever the guiding principle of its policy may be, it has failed to earn the stipulated rate on the 'C' stock. The reasons for this are too complex to be treated here, but the plain fact is that the first objective has not been to earn profits for the 'C' stock, and that its holders are powerless to enforce what they feel to be their rights. If this type of enterprise is to operate successfully in future, it is necessary that there should be effective control, possibly exercised by a Department of State whose head can be questioned in Parliament, and that the public, which calls the tune, should pay the piper."

It may be that Cross Bencher will think that, because the *Economist* began its distinguished career in 1843, it is a holder of Victorian views, on management by owners, which should be decently interred—preferably after cremation.

Cross Bencher's references to the Metropolitan Water Board and the Port of London Authority as though analogous to the London Transport Board omit to explain the entirely different control of the former bodies, the responsibilities of their directorates, and their means of meeting their capital issues.

His reference to private investors endeavouring to protect their capital "in the face of directors with their pockets stuffed full of proxies" is picturesque but incorrect. The proxies are those made by the "private investors," if they happen to be shareholders, in the name of any other shareholder they wish to nominate to act for them in their absence, and it is the whole body of shareholders and not private investors or directors as such, who vote. In any large company it is in the interests of the shareholders as a whole that a chance majority of those able to attend a meeting in person should not be led by some soap-box orator to act against the interests of the whole body, and proxies are therefore necessary. To describe the election of directors by those present in person or by proxy as a system of self-appointed directors is an absurdity, as each director in a normal company although appointed in the first instance to fill a vacancy, in accordance with the company's constitution, comes forward for re-election at regular intervals. Those who, willingly and not by Act of Parliament, invest in a business concern know its constitution, and if they consider it should be run not by its owners but by someone else they had better invest their savings in Government stocks unless they think the profit motive in so doing is wrong.

The prices of the L.P.T.B. stocks, to which Cross Bencher refers, are no doubt due to the fact that the board, in association with the main-line railways, has a complete monopoly of public transport inside the London area. But as to the financial position of the board, it remains to be seen whether the late Mr. Frank Pick's opinion, given in 1938, will prove correct: "The capitalisation of the board would seem to have reached a stage, if not already to have

exceeded it, in which additional prior charges cannot be contemplated by even the financial conscience, if there is such. The current methods of finance would appear unsuited for further employment."

Yours, etc.,
THE WRITER OF THE ARTICLES

The Belgian Congo and the Lobito Route

Benguela Railway Company, London Committee,
Princes House, 95, Gresham Street,
London, E.C.2. September 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your article "Railway Development in the Belgian Congo" which appears in the issue of *The Railway Gazette* dated September 24, 1943, no mention is made of the short western route giving direct rail connection to the Port of Lobito. Your article, in fact, gives the impression that the only routes at present available for copper for export from Katanga are the rail and river connection *via* Bukama, Port Francqui, and Leopoldville, to Matadi, and by the Rhodesia Railways to Beira; whereas, particularly for the transport of copper from the Katanga region, the Lobito route offers the most direct and economical connection to Europe, Great Britain, and the U.S.A. With regard to zinc, manganese, and other low-priced minerals from Katanga, the Lobito route is the only one by which it is economically possible for these to be exported.

We shall be glad if, in your next issue, you would correct the impression which your present article conveys, and draw attention to the short and economical connection which the Lobito route affords to the Belgian Congo.

Yours faithfully,
Companhia do Caminho de Ferro de Benguela,
LAVRADIO,
Director Manager of the London Committee

[We are glad to publish this letter, as it once again directs attention to an important railway route which has often been described in our columns. Its importance was emphasised at some length in an illustrated article in our issue of February 27, 1942, and it was shown prominently on the map which we published on June 4, 1943 (page 558), to which we directed attention in the more recent article to which our correspondent refers. As the last-named article dealt with railway developments in the Belgian Congo, and no portion of the Benguela Railway is actually in that country, we do not think that we conveyed a false impression to our readers. The importance of the export route *via* the Benguela Railway to the port of Lobito is naturally appreciated alike by industrialists and transport officials concerned with the Katanga region.—ED. R.G.]

Coaling Plants

8, Lampton Avenue, Hounslow,
Middlesex. September 25

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Like Mr. Dalziel, I had hoped to see my challenge taken up by an officer of a Locomotive Running Department, as it was the operational aspect of the problem which prompted my letter. But it is a pleasure to cross swords with so erudite an adversary, and I therefore beg leave to reply to the points he raises.

The defence and counter-attack appear to rest on four main considerations:—

1. Suitable siding accommodation does not exist, and its provision would be expensive.
2. A container system would require special wagons.
3. Locomotives, being mobile, can easily run to central points for coaling.
4. Coaling is part of the servicing routine, and is therefore best performed at the shed. Watering is a speedier process.

No comment is made on the other advantages claimed for the container plan.

I agree that the companies would probably find it expedient to make considerable track alterations to get the best out of the system, but I think your correspondent is too sweeping in his statement. Recent travel, with an eye for this particular point, has surprised me with the number of places where the system could be installed immediately with no more than minor alterations in local operating schedules.

In the proximity of sheds, little extra accommodation would be needed. The capacity of a coaling plant is about 150 tons, so that if the bunkers are kept full, and empty wagons removed immediately, only about seven to fifteen wagons-length of siding is saved.

2. Much of the coal is already transported in specially built "Loco: Coal" trucks. I would replace one special type by another.

3. Does your correspondent really suggest that a locomotive is being used efficiently when it has to run all round the parish for its fuel? Man is a mobile animal, yet the essence of modern mass production is to take the work to the man, not the man to the work. So, in railway operation, the locomotive is the unit around which the whole fabric of the industry is built. A railway is only in productive operation when its engines are pulling trains, and any other movement is wasteful, and should be eliminated if possible. Similarly, any unnecessary time spent in the shed is wasteful, and the whole question of servicing is raised by this point.

4. I am of the opinion that far too little attention has been given to the servicing of engines compared with that bestowed upon design and construction. I believe that changes will come, and I foresee the day when the locomotive will arrive at its shed after a run, and be fallen on by a gang of men whose duty it will be to clean, coal, water, oil, effect minor repairs, and have the engine back in service at the earliest possible moment. To those of us who deplore the passing of the one crew-one engine principle, such a state of affairs is not attractive, but the strength of the factors contributing to the change is undeniable, and whether we like it or not, this is the shape of things to come. Thus, coaling (which will occupy only a minute or two—certainly less time than watering) will take place simultaneously with the other servicing events.

So we see that even in the service shed, where the greatest case for coaling plants can be made, there exists, in fact, no case at all in modern locomotive economy.

Finally, I would suggest that the skip hoist for topping up is a step in the same direction as the container system, but without the advantage of its mobility.

Yours faithfully,
C. L. LINDLEY

"Kelly's Railway Guide"

Bordyke, Burgess Hill,
Sussex. September 23

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The issue for January 1, 1859, of *Herapath's Railway & Commercial Journal* had an advertisement of the "Post Office London Directory, 1859," and of "Kelly's Railway Guide for January," "now publishing."

In *Herapath's* next issue (January 8, 1859) is a review of "Kelly's Railway Guide" which says: "As the price of the book is sixpence, any one can see for himself what the plan is, and thus save us the trouble of a detailed description"; it proceeds to quote from a circular issued by Kelly's, from which it appears that this railway guide was of the A.B.C. pattern.

It would be of interest to know if any of your readers have come across a copy of this railway timetable. Unfortunately, I have not, but would like to do so. The Manager of Kelly's Directories Limited wrote to me that "we have no knowledge of the publication, and do not think it could have been published by us." It may be that, later, "Kelly's Railway Guide" was merged in the "A.B.C. Railway Guide." It is curious that Kelly's, in its circular quoted by *Herapath*, says: "Similar guides for London were also published as far back as 1852, under the name of 'Shaw's Alphabetical Time Tables,' the copyright of which (whatever it may be worth) we have recently purchased."

I have never been so lucky as to see a copy of "Shaw's Alphabetical Time Tables," but should like to do so.

The ownership and offices of Kelly's Directories changed some few years back; possibly at that time all out-of-date matter was treated as waste paper.

Yours faithfully,
G. A. SEKON

Early Electric Traction

Essex House, Essex Street, Strand,
London, W.C.2. September 21

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The City & South London Railway (incorporated in 1884 and opened in 1890) was not the first proposal for an underground electric railway in London. In 1882 the Charing Cross & Waterloo Electric Railway Company was incorporated by 45 & 46 Vic. cap. 255 with an authorised capital of £100,000 and borrowing powers of £30,000 to make an electric railway under the Thames between the two points indicated in its title. In 1885, however, an Act was passed for the abandonment of the railway (48 & 49 Vic. cap. 71).

Blackpool must have been one of the pioneers in electric trams. I remember seeing electric trams on a conduit system on the streets there in April, 1890.

Yours faithfully,
KENNETH BROWN

The Scrap Heap

CAUSE AND EFFECT?

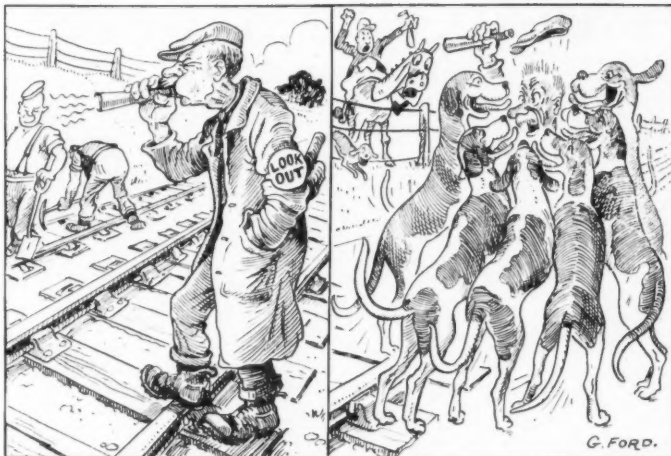
Tectotaler, non-smoker, and vegetarian, 65-year-old William Hirst, L.M.S.R. Wagon Examiner at Dewsbury, never took a mid-day meal and was never once absent from duty. He has just retired from the L.M.S.R.

ON LIBERTY

Every function super-added to those already exercised by the Government causes its influence over hopes and fears to be more widely diffused, and converts, more and more, the active and ambitious part of the public into hangers-on of the Government, or of some party which aims at becoming the Government. If the roads, the railways, the banks, the insurance offices, the great joint-stock companies, the universities, and the public charities, were all of them branches of the Government; if, in addition, the municipal corporations and local boards, with all that now devolves on them, became departments of the central administration; if the employés of all these different enterprises were appointed and paid by the Government, and looked to the Government for every rise in life; not all the freedom of the press and popular constitution of the Legislature would make this or any other country free otherwise than in name. And the evil would be greater the more efficiently and scientifically the administrative machinery was constructed—the more skilful the arrangements for obtaining the best qualified hands and heads with which to work it.—*Extract from John Stuart Mill's "On Liberty."*

STRAPHANGING DOWN THE YEARS

About 8,000 of the new spring-straps, each consisting of a moulded plastic knob, attached to a length of high-tensile woven cord surrounded by a tapered helical-spring, have been fitted in Underground coaches, replacing rubber straps which have become unserviceable. A review of the use of straps in railway vehicles in London shows that the Central London Line introduced leather straps, when a newspaper of the period coined the word "straphanger"; in the right-hand illustration below, a strap of this type is shown beneath the date 1906. Improved types were introduced on tube railways in 1923 and in 1926. Twelve



Tracked

years later there appeared a variety made of moulded rubber. The left-hand illustration below shows the types of strap introduced at various dates on the surface lines; that of 1904 is similar to the 1906 tube-line variety. The 1938 type is a larger version of that of the tube lines of the same date. A strap resembling the 1943 tube type is under consideration for surface coaches.

A HARD WORLD

When the "pay as you earn" income-tax plan begins to operate next April, one of the civil servants principally responsible for it will be living a quiet retired life at Taunton. Sir William Ewart Diggins, Chief Inspector of Taxes, has retired at the age of 61.

Sir William tells me he is pleased with the scheme; he thinks it will work well, without providing any great administrative difficulties. He admits, however, that employers will have some extra work.

The steadily growing total of tax gives Sir William no pleasure. There was a touch of melancholy in his voice when he spoke of it. In 1899, when he joined the Civil Service, the estimate was well under £100 millions. For 1938-9 it was £341 millions. For the current year it is £1,200 millions—with £500 millions E.P.T. on top of that. Sir William sighed. "It's a hard world," he said.

The man who succeeds to his £1,700 a

year job is his deputy, Mr. John James Cater.—*From Londoner's Diary in "The Evening Standard."*

TAILPIECE

(A renewed drive for fuel economy on the railways has been inaugurated)

A moving thread of white across the plain

From out the smokestack of a distant train

Is part of England's beauty, England's gain.

The sight is welcome in that landscape set,

But smoke means coal that is so hard to get,

And now in wartime may be scarcer yet.

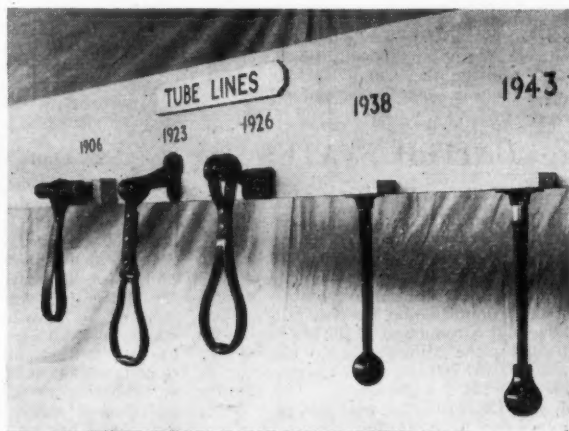
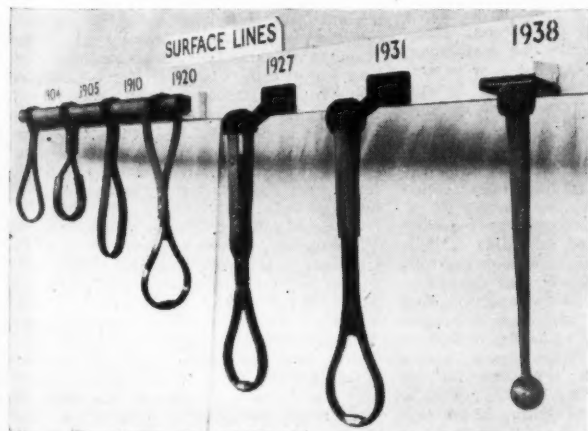
Nor easier from a distant earth to raise Is oil that comes by guarded waterways In hazard every hour of many days.

This coal, this oil that make the wheels to go

Are things that should be treasured.

Treat them so!

F. C.



Straps in use at various dates on London Underground lines (see paragraph above)

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

CANADA

C.P.R. and C.N.R. Earnings

Combined gross earnings of the Canadian Pacific and Canadian National Railways in the first seven months of this year showed an increase of \$67,682,000 over the figure for the same period of 1942. The total of \$413,189,000 set a new high record for the 1943 period. This result reflects the continued heavy demand for the railways' services. Compared with the low figures recorded during the 1933 depression, when the gross earnings for the first seven months were \$141,623,000, the increase this year is \$271,566,000.

For the month of July last both railways reported sharp increases in gross earnings; that of the C.P.R. was slightly larger on a percentage basis. The latter showed gross earnings of \$26,642,000; the C.N.R. recorded gross earnings of \$39,832,000.

For the first seven-month period of this year C.P.R. gross earnings were \$162,873,000, compared with \$142,959,000 for the same period of 1942. C.N.R. gross earnings in the same period of this year were \$250,316,000, compared with \$202,548,000 for 1942.

Freight Tonnage

The tonnage of freight moved by the Canadian railways continued at a high level during the month of July last, and, although the total of 8,701,000 tons was lower by 335,000 tons than that for June, it represented the greatest freight movement for any month of July, and was 611,000 tons above the figure for July, 1942. The previous record for July was set up in 1929, when 6,997,000 tons were moved; the figure for 1939 was 4,755,000 tons. There have been four months only when more freight was moved than in July last: these were June, 1943 (9,036,000 tons); October, 1942 (8,749,000 tons); October, 1928 (10,665,000 tons); and November, 1928 (9,400,000 tons), when record wheat-loadings were attained. The volume of wheat movement also has affected tonnages this year.

The total freight-tonnage handled in the first seven months of this year was well above that of any previous year; the figure of 55,858,000 tons loaded was more than double that of 27,551,000 tons in the similar period of 1939, and shows an increase of 8 per cent. over 1942, 19 per cent. over 1941, and 42 per cent. over 1940. The increase in tonnage handled, over that of last year, was accomplished despite the fact that the number of wagons loaded, 1,925,000, was 4,000 fewer than in 1942.

UNITED STATES

Railway Losses by Fire

A substantial reduction in losses by fire during 1942, as compared with 1941, is reported by the Association of American Railroads. Figures published by the Fire Protection & Insurance Section of the A.A.R. Committee on Records & Statistics show that a reduction of 22 per cent. was effected in the estimated cost of loss by fire, from \$7,457,760 to \$5,781,510, or from \$27.5 to \$21.7 a track-mile. The number of fires decreased by only one per cent., from 4,648 to 4,593, but the average loss from each fire was 22 per cent. less. Train wrecks proved to be the most costly item,

and accounted for \$1,298,630 in 1942. Smoking and dropped matches were responsible for a total loss of \$862,760, and sparks from engines for \$347,590.

Among unusual types, or causes, of fire, trespassing is debited with \$208,230 loss, concealed sparks in cotton with \$134,810, and acetylene torches with \$112,350.

Increasing Traffic and Falling Income

Freight traffic in the United States continues to increase. In the first six months of 1943, the ton-mileage of freight handled by Class I railways was about 22 per cent. greater than in the corresponding period of 1942; 68 per cent. greater than in the first six months of 1941; 104 per cent. higher than in 1940; and 143 per cent. more than in 1939; that is to say, the aggregate ton-mileage handled from January to June, 1943, was all but 2½ times that handled in the corresponding months four years earlier. Nevertheless, it would appear from the June, 1943, figures that the peak of railway revenue has been passed, due to the disproportionate toll taken by increased wage-bills and taxation. The net income of Class I railways in June 1943, was \$70,900,000, as compared with one of \$77,690,545 in June, 1942, after deductions had been made for interest and rentals; before deduction of the latter items, the corresponding figures were \$109,655,123 and \$118,737,993, respectively.

Level Crossing Accidents in 1942

During 1942 accidents at railway level crossings in the U.S.A. resulted in 1,970 deaths and 4,616 injuries, compared with 1,931 and 4,885, respectively, in 1941; the number of crossing accidents was 4,150, against 4,320. In view of the reduction in the number of road vehicles, and the nation-wide campaign to secure more careful driving, it is surprising that so little improvement has been obtained, although a 13 per cent. increase in train-mileage doubtless has exerted an influence. The highest frequency of fatal accidents, in which road vehicles run into the sides of trains, was shown between midnight and 3 a.m. Of 3,645 collisions with road vehicles, 1,088 involved a car or lorry running into the side of a train (849 times after dark, and 239 in daylight); and 2,557 a train striking the motor vehicle (1,661 times after dark, and 896 in daylight). Some 36 per cent. of the accidents occurred at crossings protected by lowered gates, audible or visible signals, or watchmen, and no improvement was secured in this respect over the 1941 casualty figures. The number of pedestrians killed at level crossings increased by 78.

St. Louis Union Station

Various improvements have been carried out recently at the Union Station in St. Louis, which is owned by the Terminal Railroad Association of St. Louis, a joint concern of most of the seventeen railways which use the station. It was opened in 1894, after two years of construction, and replaced a crowded and uncomfortable station on 12th Street. The Union Station has a 600-ft. Romanesque facade, and a clock tower 247 ft. high; it has been for long an ornament to the city, which gradually has cleared away surrounding slum property, and has set off the station frontage with a large open square.

Originally the operating portion of the

station had 32 tracks in a train shed 600 ft. by 600 ft., but 10 tracks were added in 1931, and the station now has 42 platform roads on one level and under one roof, which is claimed to be a world's record. Originally, access to the Union Station was by way of the Eads Bridge over the Mississippi, and then up a steep gradient through a tunnel with bad atmospheric conditions; but the Merchants Bridge, 6 miles to the north, and the more recent Municipal Bridge, or Douglas McArthur Bridge, as it is now called, have made it possible to reach the station by means of overhead tracks; the tunnel is to be closed shortly and the Eads Bridge will then be turned over exclusively to highway traffic.

Many of the best-known American streamline trains use the Union Station, such as the National Limited of the Baltimore & Ohio Railroad, the Spirit of St. Louis and the Jeffersonian of the Pennsylvania Railroad, the Eagle and Colorado Eagle of the Missouri Pacific Railroad, the Abraham Lincoln of the Alton Railroad, the Green Diamond of the Illinois Central System, and four of the Zephyr services of the Chicago, Burlington & Quincy Railroad.

SWITZERLAND

Private-Railway Mergers

Two railway systems were formed on January 1, 1943, with the titles of Emmenthal-Burgdorf-Thun Bahn, and Chemins de fer Fribourgeois Gruyère-Fribourg-Morat, respectively. The former consists of the late Emmenthal Bahn and Burgdorf-Thun Bahn, which in practice already formed a single unit and pooled their rolling stock, together with that of the Solothurn-Münster Bahn, which is part of the same group, but is not included in the merger. This standard-gauge group is one of the most up to date in Switzerland; during recent years it has built, rebuilt, and modernised rolling stock, installed colour-light signals, and carried out track works, such as the realignment of curves, and rail-welding.

The Chemins de fer Fribourgeois was formed by the merging of the three private undertakings in Canton Fribourg: Chemins de fer Electriques de la Gruyère, Chemin de fer Bulle-Romont, and Chemin de fer Fribourg-Morat-Anet. The new undertaking operates the road services formerly worked by the C.E.G., involving 268 route-km. and 32 buses, 12 lorries, and a number of trailers and other vehicles. The rail system has no continuity; the southern terminus of the Fribourg-Morat-Anet line is connected with the Gruyère line at Bulle only by two road-motor routes. The Bulle-Romont is a standard-gauge steam-worked line (connecting with the Berne-Lausanne main line at Romont); the Gruyère is a metre-gauge line electrically-worked on the overhead system at 750-1,000 V; and the Fribourg-Morat-Anet is a standard-gauge electrically-operated line using third rails (except in stations, where overhead wires are installed).

The initials of the Chemins de fer Fribourgeois are the same as those of the Chemins de fer Fédéraux, and rolling stock of the former is being lettered G.F.M. So far there has been no change in the liveries of green for the Gruyère, black for the Bulle-Romont, and red for the Fribourg-Morat-Anet systems. There is little likelihood of these three lines achieving actual physical unity; the new arrangement has been made purely from a financial standpoint. It is proposed to electrify the Bulle-Romont line when the materials are obtainable.

The Railways of Venezuela

Separate lines, from coast to highland, total 634 route miles on four gauges

VENEZUELA, with an area of 393,976 square miles, or about twice that of Germany, is in the northernmost part of the South American continent, with over 2,000 miles of coast line on the Caribbean Sea and bounded by British Guiana, Brazil, and Colombia. The population was estimated in 1937 at 3,451,677. Transport facilities are afforded more readily by the 6,000 miles of navigable rivers and by Lake Maracaibo than by any other means, and the network of roads that has been constructed in recent years is seriously competing with the existing railways for the limited amount of landborne traffic. As to railway development, the nationalisation policy so often found in other countries appears to be lacking. At present three of the principal railways, with an aggregate length of 193 miles, belong to British companies.

There are now some 634 miles of railways in public service in Venezuela, exclusive of the small industrial lines serving mines, oilfields, and plantations. Generally, the principal railways give access from the coast to the highlands, but there are no lines in the central districts. There is no uniformity of gauge. Slightly over half the mileage (338) is on the 3 ft. 6 in.; 123 miles are on the 3 ft.; 37 miles are on the metre; and 136 miles on the 2-ft. gauge. The longest line, that of the Bolivar Railway Co. Ltd., with 136 miles (extending from Tucacas to Palmasola, San Felipe, Aroa, and Barquisimeto), is all on the 2-ft. gauge, and this is also the oldest railway in the country, dating back to 1877. It was built to serve the historic copper mines at Aroa. The Venezuela Central (54 miles, of which 8 are electrified) was owned until 1938 by a British company, but was taken over and is now worked by the Govern-

ment; it extends from Caracas to Ocumare del Tuy.

The most interesting railway in the country is the La Guaira & Caracas, which connects La Guaira, the principal port, with Caracas, the capital. This line, which was built in 1883, was electrified in 1927. Caracas is only 7 miles from the coast but the railway has to climb 23 miles by a circuitous route, and at 20 miles from the coast the height reached is 3,105 ft. above sea level. The climb, through many complicated loops and hairpin bends, provides one of the most spectacular journeys in the world. The single journey takes 1½ hr.

Caracas is connected with Valencia by the Gran Ferrocarril de Venezuela, built by a German company in 1894, but transferred to the present Spanish company in 1924; German interests are said to predominate still. Valencia is connected with the coast by the Puerto Cabello & Valencia Railway, a British-owned line which is leased to the Bolivar Railway Company. A new line, 34 miles in length, on the 3 ft. 6 in. gauge, has been built for the Government by a Danish company. It runs parallel to the coast, to link up Palmasola, on the Bolivar Railway, with El Palito on the Puerto Cabello & Valencia. Work was begun in July, 1939, and the line was opened on March 22, 1942. The Government has secured 40 goods wagons for this railway, and has made an agreement with the adjacent lines for joint operation. Through running is possible with the Puerto Cabello & Valencia Railway, as it is also of the 3 ft. 6 in. gauge, but transhipment is necessary at Palmasola for the 2-ft. gauge Bolivar Railway. Direct connection between Tucacas and Puerto Cabello is made by the railway company's steamers. This new branch

also serves extensive banana plantations. No important railway development appears to be contemplated at present in Venezuela. Subjoined is a descriptive list of the principal railways:—

	Gauge	Route mileage
Privately-owned railways:		
Bolivar Railway Co. Ltd.	... 2 ft.	136
Gran Ferrocarril de Venezuela (Cia. de FFcc. Sudamericanos, Madrid)	... 3 ft. 6 in.	112
Puerto Cabello & Valencia Railway Co. Ltd. (leased to Bolivar Railway)	... 3 ft. 6 in.	34
La Guaira & Caracas Railway Co. Ltd. (Electrified)	... 3 ft.	23
Tachira (C.A. Gran Ferrocarril del Tachira)	... 3 ft. 6 in.	81
La Ceiba (C.A. Gran Ferrocarril de la Ceiba)	... 3 ft.	53
Carenero (C.A. del Ferrocarril de Carenero)	... 3 ft.	34
Macuto-Costa (La Guaira Harbour Corporation Limited) (electrified)	... 3 ft.	5
		478
State-owned railways:		
Venezuela Central (8 miles electrified)	... 3 ft. 6 in.	54
Santa Barbara—El Vigia (leased)	Metre	37
Guanta—Barcelona—Naricual	3 ft. 6 in.	23
La Vela—Coro	... 3 ft.	8
El Palito—Palmasola	... 3 ft. 6 in.	34
		156
Total route mileage		634

Among the smaller (and isolated) railways, mention may be made of the Guanta-Barcelona-Naricual State Railway, 23 miles of 3 ft. 6 in. gauge. It links the port of Guanta with Barcelona (the capital of Anzoategui), a distance of 11 miles, and continues to the coal mines at Naricual. The Tachira Railway, extending from Encontrados to Estacion Tachira, is part of a rail-water link, as Encontrados (40 miles up the River Zulia) is reached by steamer from Lake Maracaibo. The Santa Barbara to El Vigia Railway, a metre-gauge line which is leased by the Government to the F.C. de Santa Barbara a El Vigia, provides a link in the communications to Merida, the capital of its State. Steamers run via Lake Maracaibo and the River Escalante to Santa Barbara, and mules maintain the final section from El Vigia to Merida.



Sketch map of the railways in Venezuela carrying public traffic

Manpower

Some observations on its relation to production

From a Correspondent

AT no time in the history of this nation has the question of the usefulness of "manpower" been so prominent in the minds of those responsible for the conduct of the war, and indeed, of all leaders of industry, as it has at present. This realisation of its vital importance has been accentuated by statements that availability of manpower in this country—one might almost say in all countries—has reached its limit.

It requires no stretch of imagination to realise that it is only the net available effort which is convertible into useful output, and only then when this available effort is directed into essential channels, as there are many instances where misdirected effort can absorb energy without producing useful results. Such being the case, there appears to be an urgent necessity for investigating the relation that production bears to manpower and to consider ways and means by which maximum output can be obtained from the minimum number of workers.

It will be evident that any improvement in the output of useful work can only be effected by the elimination, as far as possible, of those causes or losses which militate against the complete conversion of human effort into required production.

For simplification of approach, this problem should be viewed as a balance sheet in which the only real and tangible assets are the man-hours actually spent on production—the gaps between gross and net available hours being represented by losses. It cannot, of course, be gainsaid there always are and always will be unavoidable losses due to various causes, but the object of this article is to suggest action which should be taken to reduce that loss to a minimum by analysis and research into the whole matter. Although the reasons are many and varied, it is felt that the following instances will give a general picture of the sources of loss, although it is not considered possible to place these headings in order of relative importance because of the immense variety of industrial work carried out, each calling for its particular organisation.

Unsuitability of Lay-out of Factory

It is realised that many factories, especially at the present time, called on to undertake work for which they were not originally built, present many difficulties when being adapted for wartime duties, and the measure of their adaptability can be determined only by actual planning—there must be many, however, which by slight re-arrangement of plant and equipment can be so laid out as to give maximum useful productive effort.

A time study of operational movements should enable the supervisor to determine the space required to produce any given output and the position or lay-out of the necessary plant and equipment in such a manner that useless manual or material movements are entirely avoided. Such a procedure will not only save hours for essential work but can in many cases bring to light superfluous operations in any existing design.

Inadequate Equipment

It is known by any manufacturer that inadequate or unsuitable machines or

plant have the effect of slowing down production and thereby increasing man-hours on any particular job, and here again the rhythmic effect of any particular lay-out will be dependent on the selection of the most suitable type of equipment. Whether it be machines, tools, or fixtures, the most complete user of that equipment will be obtained by the avoidance of all unproductive periods due to such causes as breakdown of machines, waiting for material, waiting for replacement of tools, and all the many other factors which form part of the daily loss in production.

Incorrect Relation between Material and Design

Loss of time due to an unnecessarily high percentage of scrap is also a matter which is not infrequently overlooked, involving as it does not only a loss in connection with the article produced, but, in addition, waste in manpower by producing more raw material than is necessary, and handling this excess raw and scrap material.

Loss of Time through Sickness

Loss of time through sickness is of very great concern to the employer, particularly when it is realised that it is not only the sick person's time which is lost, but the effect which it has on the team of which he may form a working member—which by virtue of his absence may become immediately unbalanced—a condition which is difficult to stabilise at short notice.

Another reason why sickness should be prevented as far as is humanly possible is that a sickening person is not only prone to low rate and inferior work, but is also more liable to accident for various reasons. In effect a sick person does not only represent loss of output, but he at once becomes a charge on the community.

The secret of reducing sickness to a minimum is broadly in making the worker's environment such that he or she may have a reasonable prospect of keeping fit—in other words, that his or her surroundings may be as far as possible compatible with the common laws of health. Statutory regulations covering working conditions have advanced very considerably during the past few years, and this has improved these conditions for industrial workers, but experience shows that whereas general regulations go a long way, there are local and individual questions which must be left to the discretion and foresight of the manager or overseer of a factory.

The root causes of sickness in respect of the great variety of trades are those brought about by simple beginnings; for example, unsuitable regulation of temperature of shops or offices, working in draughts or in damp or wet clothing, standing for long periods on cold stone floors, lack of general cleanliness and working in an atmosphere impregnated with injurious matter. These and other conditions all contribute to sickness and can be avoided by a little trouble and foresight on the part of those in control.

Avoidance of Accidents

The prevention and cure of accidents covers such a wide field that it is a subject entirely on its own. Its occurrence,

however, has the same disturbing effect on output as does sickness, but in addition it has the more serious result in some cases of partially or wholly incapacitating the worker. The educating of the worker to meet the risks of danger he or she may have to face, the provision of suitable clothing, and the protection of all machines, equipment, or material to be dealt with, are matters which require full consideration and the frequency or otherwise of accidents, whether severe or light, will depend very largely on the initiation of a sound accident organisation backed up by the constant observation of welfare authorities.

Cases are known where by the fixing of a fool-proof guard to a machine accidents have been prevented, and the output of work has immediately increased by 50 per cent. due to the fact that all fear of mishap has been banished.

Mental and Physical Fatigue

It has been demonstrated that fatigue, no matter in what form, tends to lower the quality and quantity of tasks to be accomplished for the very reason that human beings are very much like a finely-tempered spring, which if overloaded will lose its resiliency, and if subjected to incessant reversals tend to crack. It is important, therefore, that these human frailties should be studied to get the best results. The amenities provided by the most modern works or factories do meet all requirements with a great measure of success and the welfare side of such work improves greatly year by year, but emergencies such as war conditions always bring in their train quick and rapid demands for more and more output which tends to throw out of step such considerations as the welfare of the workers. There are many causes of fatigue, but to take just two or three examples: it is well known that excessively long hours are not conducive to consistently good work or high rate of production, monotony also is to be avoided as far as possible, as it has been found in extreme cases to lead to breakdown, standing for lengthy periods is also detrimental, as well as working at machines or benches where the height from the floor causes a stooping or awkward position for the worker. The above are just a few instances, but there are many more which result in undue fatigue in one form or another.

Incorrect or Inadequate Lighting

The effect which the form and power of lighting in any place of work has on occupants is not always appreciated to the full extent, as it may have quite a considerable bearing, not only on the health of the worker, but also on the quality and speed at which work is performed; for instance, lights placed or shaded in such a manner as to cause reflection or dazzling is not only injurious to the sight, but renders the work of reading small figures or fine dimensional lines very difficult. Lighting of varying intensity in different parts of the same office or building should also be avoided as far as possible, as the frequent transference of the eyes from the lights of one intensity to another, with the consequent re-adjustment of sight, tends to produce eye strain. This can be avoided by arranging lighting installations in such a manner that there will be a minimum variation in intensity.

Where machines are involved individual lighting should be provided in such a manner as to avoid the existence of shadows or blind spots. Although correct lighting may call for a certain

amount of trouble and expense the results will undoubtedly lead to happier working conditions and more satisfactory output.

Supervision

The consideration of supervision perhaps should have been mentioned earlier as the initiation and fulfilment of the requirements of employees referred to above is so largely dependent on those in control. It is evident, therefore, that the selection of supervisors sometimes made without sufficient prominence being given to the essentials of leadership should be based on qualifications embracing not only text-book knowledge, invaluable as it is; but on vision, foresight, and a psychological understanding of the workers who are to come under their control, so that by making as close a study of the worker as of the machine, by impressing on that worker the importance of the part he plays in the whole picture, by gaining his confidence and trust through expressions of justice and fair

play, by instilling into his mind the advantages to be gained by cleanliness and orderly habits, and above all by recognising that in the administration of all rules and regulations it is the spirit of those rules rather than the letter which should be the guiding principle.

Finally, the manpower of the country now constitutes such a vast army and the collective effort is so huge that even a small saving through elimination of unproductive time would represent a very useful and necessary addition to the war requirements and above all the increase in interest, well-being, and outlook of the workers brought about by orderly and colourful environment would lend to that harmonious working which knows of no defeat or limitations.

Unfit and Maimed Servicemen

One fact in connection with manpower which will need to be taken into consideration is that of the suitable placing of unfit and maimed Servicemen. These casualties, as time passes, will be return-

ing from the front to be absorbed into civil duties in ever increasing numbers. To find the most suitable job for these "unfits" will call for more than ordinary care, if output is not to be impaired; knowledge of the work to be undertaken as well as human understanding will be essential for the task as men so placed will need to be nursed through the teething processes of their jobs with tact and discretion.

It will be realised that war workers have been carried through months and years of arduous work on the wings of frenzied loyalty and a sense of fellow-feeling for friends and relatives at the front, but this feeling may not necessarily be predominant in the minds of those who feel that they have already given so much in the cause of their country. Experience shows that workers who have lost limbs or become broken in health through no fault of their own are often possessed of a complex which only a skilful treatment of consideration and kindness can eradicate.

Removal of Slip in Cutting on L.N.E.R. Main Line

Some details of work carried out recently in the London area



BECAUSE of excessive water content on and under the cutting face, a slip occurred in the slope of a cutting on the down side of an L.N.E.R. main line in the London area. Besides threatening the stability of property at the top of the

cutting, the slip lifted and pushed out of alignment the down slow line at the toe and a speed restriction of 15 m.p.h. had to be imposed on trains using this track.

Towards the end of 1941 a contract was accordingly placed with Messrs. W. & C.

French of Buckhurst Hill, Essex, for the construction of counterforts and the carrying out of drainage. The work was commenced that October and completed in June of this year.

Twelve counterforts, 8 ft. wide and having a maximum depth of 22 ft., were constructed. The excavation of these counterforts was carried down below the level of the slip, and the bottom was stepped up to follow the line of cleavage. The counterforts were filled with rubble and the excavated material was tipped in the space between; the whole was brought up to a uniform slope of $3\frac{1}{2}$ to 1. Finally, 6 in. of ashes were spread over the area between the counterforts.

Each counterfort was drained into a permanent-way drain between the down main lines. As the line of cleavage of the slip at the toe of the slip was below this drain, it was necessary to fill in the bottom step of each counterfort with concrete to bring it up to the required level.

On Sunday, May 16, 1943, possession of the down slow line was taken, the track removed, and the clay excavated to a depth of 2 ft. below the underside of the sleepers. A drag-line excavator was used for the purpose, and the clay was loaded into wagons standing on the down main line. A foot of sand was spread over the formation, and on this 9 in. of ashes. The track was finally laid in on slag ballast.

BLACK BOLTS AND NUTS.—An announcement from the Black Bolt & Nut Association of Great Britain states that the Ministry of Supply, Iron & Steel Control, has sanctioned the adoption of a new selling basis for black bolts, nuts, and other small parts; in future, reference will be made to a standard list giving trade prices per 100 units, which will be subject to a discount that may be varied from time to time. This new price list becomes a related schedule under the Control of Bolts, Nuts, Screws, Screw Studs, Washers, and Rivets (No. 4) Order, 1943, in force as from October 3, 1943, copies of which may be obtained from H.M. Stationery Office, 43, Abchurch Lane, London, E.C.4. The issue of this new price list means that as from October 3, 1943, all buyers of black bolts, nuts, set pins, coach screws, and so on, will be required to place orders by count and not by weight and these will be executed and in-

voiced by the manufacturers of the new standard trade price list per 100 units, subject to a specified trade discount. On the other hand carriage bolts and nuts will for the present continue to be sold at prices per gross as heretofore. The new selling basis is intended to remove some of the anomalies that existed on the old weight basis; for post-war export trade the new basis has the advantage of being the same as the selling basis in many countries overseas.

WAR PRODUCTION IN INDIA.—The rapid expansion of sources of war supplies in India has already been mentioned in our columns, and this expansion is continuing. The efficiency of munitions production in railway workshops is also steadily increasing, as is the number of trainees turned out as skilled artisans. Of all the almost innumerable kinds of article required today by the Army, India is now able to turn out some 90 per cent. These vary from special

armour plating and other bodies for armoured fighting vehicles and lorries to personal equipment, and from mine-sweeping trawlers to nearly every variety of ammunition. Moreover, India now ranks as the largest army clothier country in the Empire. During 1941-42 her 10,000,000 spindles and 200,000 power-driven looms supplied no fewer than 700,000,000 yd. of cotton textile material, a figure probably exceeded substantially during 1942-43.

HOTEL AND CATERING TRADE SALVAGE.—Over 400 tons of waste paper have been collected and sold for the benevolent funds of the hotel and catering trade, as a result of the unceasing efforts of its Waste Paper Recovery Committee. Industrial canteens throughout the country have contributed largely to this total. The trade has contributed thousands of tons of waste paper to the war effort and the salvage-stewards scheme has been largely responsible for the total attained.

Lowering a Rock Tunnel Floor

The shale floor of a 2,240-ft. tunnel on the Delaware & Hudson Railroad was recently lowered by from 2 ft. to 4 ft. under traffic

A SINGLE-LINE tunnel, built in 1868, near Binghamton in New York State, on the Delaware & Hudson Railroad, consists of masonry side walls with a brick arched crown. The line rises from the south and north portals to a summit in the middle of the tunnel at ruling gradients of 1 in 85 and 1 in 172 respectively. Due to the irregular surface of the shale formation, the sleepers rested on a maximum of 6 in. of ballast, but in places they lay directly on the rock floor or were even embedded in it.

As the cross section of the tunnel did not permit of the use of modern locomotives and rolling stock through it, the decision was taken to lower the floor not only to provide an additional 2 ft. of headroom, but also to permit of the use of 131-lb. instead of the old 90-lb. rail and of a uniform depth of 5 in. of ballast. The floor had, therefore, to be cut away somewhat over 2 ft. on the average, but as much as 4 ft. at certain points. To enable this to be done, the side walls had to be underpinned in concrete throughout the length of the tunnel. Opportunity was also taken to provide adequate side drainage.

To fix the new formation and rail levels, wooden pegs were driven into holes in one of the side walls at uniform heights above these levels, and at 50-ft. intervals throughout the tunnel, so as to form bench marks. With cords stretched between these pegs, and the use of wood templates, it was easy to establish the new formation and other levels.

The first work undertaken after these preliminaries, was the complete underpinning of the side walls and the construction of the new drainage system. For safety, the underpinning was carried out in detached 8-ft. sections along each side of the tunnel, as follows: On the completion of one 8-ft. section, the second 8-ft. length was left untouched, but the underpinning of the third or next-but-one length was begun, and so on. This procedure gave the concrete of the first length time to set before cutting supporting rock from beneath the adjacent length, and avoided interference between the different phases of the work. When excavation was in progress in a length, the masonry walling was supported by longitudinal rail girders resting in niches cut in the rock at the ends of the section in hand. A compressor set at each end of the tunnel supplied compressed air through a 3-in. pipe line, to the concrete breakers used to excavate the shale. The concrete was mixed at each portal and conveyed to site on special push material trolleys, 12 ft. long running on two four-wheel bogies and each carrying three two-wheel buggies of concrete, the trolleys being propelled by tractors.

The base of the concrete underpinning was founded on shale 3 ft. below the new rail level; the concrete is 2 ft. 4 in. wide at the top and 2 ft. 8 in. at the bottom, and its top surface projects into the tunnel beyond the masonry walling to form a 4-in. shelf or ledge to provide support for a future lining if provided. This also facilitated the pouring of the concrete. A 6-in. weep hole is provided every 10 ft. through the underpinning, to carry into the side drains seepage col-

lected in 6-in.-square vertical drains consisting of rock-filled recesses cut in the rock behind the underpinning, and extending to its full height. The longitudinal side drains consist of 6-in. perforated pipes laid in shallow channels cut in the rock, 6 in. below new formation level. This underpinning and drainage work was carried out by two bridge and building gangs, one working from each end of the tunnel towards its centre.

Although the shale floor of the tunnel was laminated, its excavation to so great a depth and the lowering of the track under traffic proved to be no easy task. Many methods of carrying out this work were considered and rejected, until finally it was decided to do the job by cutting down the rock to its final level by means of a series of successive overlapping ramps or run-offs connecting the old and new formation levels. Work began in the middle of the tunnel in both directions,

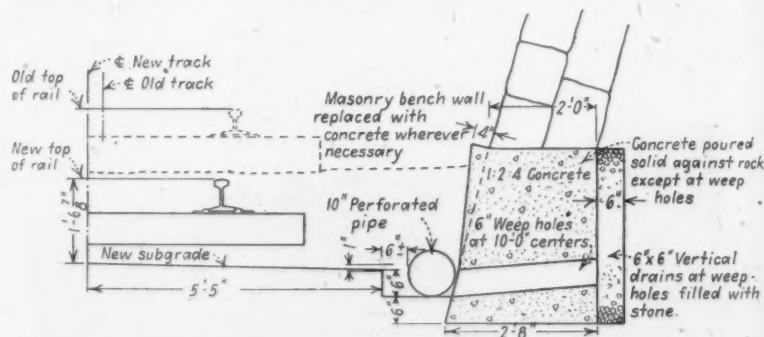
ably graduated at the ends to meet the new and old levels. As excavation proceeded, additional packing was added so that the original gradient of the ramp was not disturbed.

When the excavation had been completed throughout the run-off, the track was lowered to this new temporary formation level with the aid of jacks. The usual length of track on packings at any one time was 5½ to 6 rail lengths. Work then proceeded to the next run-off. It may be noted that in each ramped run-off, from 50 ft. to 75 ft. at the near end was excavated to final formation level, and, when beginning the next length, a similar length was packed up so as to continue the run-off for a short distance.

As each ramped length was completely excavated, a packing gang lifted the track initially on to 3 in. of ballast. The final 2-in. lift was given after completion of relaying with 131-lb. track, when the work otherwise had been finished.

To run out the new tunnel levels to meet the gradients on the approaches, some 1,200 ft. of run-out was required at each end. At the south end this had to be done under traffic, but at the north end a 500-ft. realignment assisted.

A speed restriction of 15 m.p.h. was



Typical half section in the tunnel, showing the underpinning, drainage arrangements, and relative positions of the old and new formation (subgrade) and track

working down the gradients, so that the ramp was always in the form of a counter-grade or an easing of the gradient. The same two gangs, 10 to 15 men strong, carried out this work competitively in opposite directions.

The track was first dropped on to the rock floor and timber struts were used between the sleeper ends and the side walls to avoid transverse distortion. The shale was then cut away down to its final level at the near end of the length in hand, and was tapered out to the old formation level at the far end of this ramped length. Sleeper cuts, 10-in. x 10-in. timber packing blocks and hardwood shims were used under the sleepers to adjust the track levels temporarily. To avoid any likelihood of a derailment in this single-line tunnel, great care was taken to insure the safety of trains passing over the packed-up sections, and all shims were securely nailed to the blocks. Special attention was also paid to the horizontal strutting, and there was no accident of any kind. Rock cutting then proceeded progressively from the near to the far end of the ramped length, so as to lower the formation to the new level throughout that length; the packing blocks were moved as required. Normally, the depth of the rock excavation at any time in each run-off or ramped length was about 8 in., suit-

imposed on the 12 trains normally passing through the tunnel daily, or 17 if the pusher engines of five of them, returning light, are included. A flagman was stationed at each portal controlling electrically-sounded horns placed at intervals along the tunnel. They received warning of train movements through the dispatchers' telephone line. A long and a short blast indicated the approach of a train six miles away, giving sufficient time for leaving the track in good order. Three long blasts warned the men to proceed to the nearest portal. Wooden doors were fitted at the portals which could be closed in very cold weather, not only for the comfort of the men, but also to avoid the freezing up of the water near the north portal collected from seepage. The wooden doors were manually opened and closed, but if they were not opened in time for a train, electrically-worked track signals were held against approaching trains until the doors were opened. The 131-lb. rails laid through the tunnel had been flash butt-welded into continuous lengths.

The work was carried out under Mr. P. O. Ferris, Chief Engineer, and under the direct supervision of Mr. R. S. Gutelius, Division Engineer, according to our American contemporary *Railway Engineering & Maintenance*, to which we are indebted for the drawing reproduced.

L.M.S.R. "Royal Scot" Locomotive with Taper Boiler

A famous design is rebuilt to obtain the benefits of standardisation

ROUGHLY 16 years have elapsed since "Royal Scot" locomotives were brought into use on the L.M.S.R.; the first 50 were built in 1927, by the North British Locomotive Company and 20 more were built in 1930. These fine engines were introduced to work the heaviest and fastest long-distance trains over the main line from Euston, a service in which they still play a prominent part. As a result of their long continued exercise of exacting duties, many engines of the class are beginning to fall due for new boilers and new cylinders. The opportunity is being taken, not merely to restore the engines to their original condition, but to put through certain changes. Thus the engines are to have taper boilers and newly designed cylinders; other slight modifications are being made with a view to standardisation. The accompanying illustration of engine No. 6103 shows that the rebuild makes a striking alteration in the general appearance. As they become modified, these locomotives will pass into what is known as the "Converted Royal Scot" class. No. 6103 "Royal Scots

Fusilier" is the first locomotive of the new class; it was put into traffic last June. Altogether 20 conversions have been authorised, they are being carried out at Crewe Works. Eventually, the entire class of "Royal Scot" engines will be dealt with in the same manner.

The boiler which is being used for replacement purposes is of the same type as that with which the "Jubilee" class 4-6-0 three-cylinder "5X" engines are being re-boilered, thus making one boiler interchangeable between the two classes. In the following table a comparison is made between the new boiler and that superseded:—

	New boiler	Original boiler
Evaporative heating surface—	sq. ft.	sq. ft.
Tubes	1,667	1,892
Firebox	195	189
Total	1,862	2,081
Superheating surface	357	399
Combined total	2,219	2,480
Firegrate area	31.2	31.25

Small change in the total and adhesive weights arise from the conversion. Below is given a table showing comparative figures for the weight distribution:—

	"Converted Royal Scot"	"Royal Scot"
Weight on—	Tons cwt.	Tons cwt.
Bogie wheels	22 0	22 8
Leading coupled wheels	20 7	20 18
Intermediate coupled wheels	20 9	20 18
Trailing coupled wheels	20 4	20 14
Adhesive weight	61 0	62 10
Total engine weight	83 0	84 18

Wheel diameters, cylinder dimensions, and boiler pressure are indicated on the accompanying diagram; they remain unaffected by the conversion. This applies also to particulars of the tender.

AIR POWERS FOR DONALDSON LINE.—On a petition of the Donaldson Line Limited, the Scottish Court of Session on October 1 issued an interlocutor confirming an alteration of the memorandum of association of the company so as to empower it to establish and maintain air transport services. The Court also authorised a similar alteration in the case of the Donaldson Atlantic Line Limited.



General view of "Converted Royal Scot" locomotive

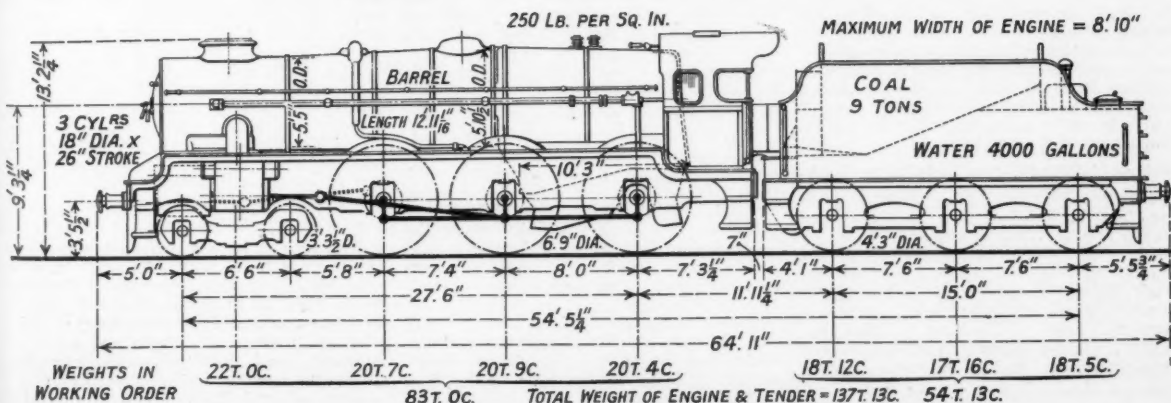


Diagram giving principal dimensions and axle loads

Railway Mobile Cinema and Exhibition Coaches



The coach in use for a fuel economy exhibition



Salvage exhibition coach



A photographic display of railway activities



Interior of the photographic exhibition coach

PAPER shortage has made necessary a reduction in the use of posters and similar means of informing the public of the activities of the railways, and to meet the need for up-to-date information the British railways have been running a series of tours with special coaches giving photographic displays of their war efforts, another fitted up with samples of salvage made up into useful articles, and a cinema coach in which have been shown various films connected with the war.

Railways' Photographic Exhibition Coach

This coach visited 285 stations (including four in London) and was seen by 50,990 persons between June and October, 1941. The exhibit consisted of photographs covering all spheres of railway work during the war period, including the evacuation of children from suspected danger areas, blackout difficulties, A.R.P., bomb damage and consequent repairs thereto, and troop traffic.

Salvage Films—L.M.S.R. and S.R.

On April 1, 1941, the L.M.S.R. began a tour with a salvage film, shown in a

mobile film unit. Up to the present the film has been seen by 49,000 people.

Between December, 1941, and July, 1942, a Southern Railway film dealing with salvage was exhibited at 77 stations on the Southern and Somerset & Dorset lines and was visited by 13,326 persons. This film was shown to assist the staff to become salvage-minded.

L.M.S.R. Salvage and S.R. Cinema Coaches

The L.M.S.R. salvage exhibition coach was designed to show L.M.S.R. staff, in a practical way, how they could intensify their salvage effort. It showed, too, what happened to the salvage after it had been collected. In a ten months' tour the coach visited 107 towns, 78 mayors and civic leaders performed opening ceremonies, and 110,000 people passed through the coach.

Subsequently the L.M.S. salvage coach was loaned to the Southern Railway and along with an S.R. cinema coach started in May, 1943, a tour on the S.R. system. The tour of these two vehicles will continue to the end of the year. During the three months, May to July,

12,837 persons visited the salvage coach, and 1,596 adults have visited the cinema coach to see the Government salvage film, national savings, and fuel economy films. In the same period 1,727 children from local schools saw the "Dustbin Parade" (a salvage film), Mickey Mouse, etc. These children were in organised parties from schools and admission was by handing in a piece of salvage. The amount thus collected was just on 5 tons. In conjunction with this tour, special films dealing with the Home Guard have been shown to 1,796 members of S.R. units.

Fuel Economy Coach

The tour of this coach commenced at Hammersmith on April 28 this year, and completed its run at the end of August. From April 28 to August 4 it had visited 15 places and had been seen by 21,466 persons in the south, west, and north of England, and Scotland. Photographs, diagrams and so forth, show means of saving fuel and light. There is a special section showing how the railways are helping in the fuel economy campaign.

RAILWAY NEWS SECTION

PERSONAL

Colonel Edward Birnie Reid, a partner in the firm of James Meston & Company, chartered accountants, has been appointed a member of the Scottish Committee of the London Midland & Scottish Railway Company.

We regret to record the death on October 1, at the age of 53, of the Rt. Hon. the Earl of Plymouth, Parliamentary Under-Secretary of State for Foreign Affairs, 1936-39, who was Parliamentary Secretary, Ministry of Transport, 1931-32. His father was a Director of the Great Western Railway Company, and had been Chairman of the Barry Railway Company from its inception until the amalgamation.

Mr. George Ruston Sharpley, Chairman & Managing Director of Ruston & Hornsby Limited, will retire from the latter position at the end of the year. He will continue to be Chairman. Mr. Victor W. Bone (a member of the board of Ruston & Hornsby Limited) will relinquish the position, which he has held since its formation in 1930, of Managing Director of Ruston-Bucyrus Limited, an associate company, and will succeed Mr. Sharpley as from January 1, 1944. Mr. Ernest S. Everitt, Assistant Managing Director of Ruston-Bucyrus Limited, has been appointed Managing Director.

We regret to record the death on September 29, in his 92nd year, of Mr. Harold T. Hartley, a partner in the firm of Emmott, Hartley & Company publishers, founders of *The Textile Manufacturer*, the *Chambers of Commerce Chronicle*, and the *Warehousemen & Drapers' Trade Journal*. Mr. Hartley was the father of Sir Harold Hartley, a Vice-President of the L.M.S.R.

SOUTHERN RAILWAY APPOINTMENTS

The Southern Railway announces the following appointments as from October 1:

Mr. W. H. F. Mepsted, Divisional Superintendent, Southern Division, Southampton Central, to be Assistant to Commercial Superintendent.

Mr. F. C. Bishop, Assistant Divisional Superintendent, London Central Division, to be Divisional Superintendent, Southern Division.

Mr. J. Bridger, Stationmaster, Victoria, to be Assistant Divisional Superintendent, London Central Division.

Mr. J. E. Sharpe, M.B.E., Assistant Superintendent of the Eastern Section, Southern Area, L.N.E.R., retired on September 30, after just over 45 years' service. Mr. Sharpe commenced his railway career in April, 1898, as a clerk in the Superintendent's Outdoor Working Office of the former Great Eastern Railway at Liverpool Street, and during this period was awarded a first prize of £10 in a signalling and outdoor-working examination. In 1908 he was promoted to the post of Secretary to the Superintendent of the Line, and seven years later became Personal Assistant to the Chief Traffic Manager. In 1919, he was appointed Chief Clerk to the Superintendent, and in 1924 was made Chief of the Works, Accident & General Sections. In 1935 he was appointed Assistant to the Superintendent, Eastern Section, and in 1938 was appointed Assistant Superintendent.

Mr. S. A. Heaps, F.R.I.B.A., Architect to the London Passenger Transport Board, who, as recorded in our last week's issue, has retired from the board's service, has been responsible for the design of many stations, sub-stations, depots, garages, and other buildings. Since 1925, when the Golders Green to Edgware extension was constructed, he has designed many stations serving railway extensions, and re-designed existing stations; he collaborated with Mr. Charles Holden in the design of a number of stations on the Northfields and Cockfosters lines, and he played an important part in the replacement of lifts by escalators. He designed the railway depots at Neasden, Hainault, and Aldenham (the



Mr. S. A. Heaps

Architect, Underground Railways, 1910-33
Architect, L.P.T.B., 1933-43

last-named is not yet in service), and the well-known overhaul works at Acton. Mr. Heaps was articled to a London architect in 1896, and subsequently gained experience in various engineers' and quantity-surveyors' offices. In 1903 he joined, and in 1910 was appointed Architect to, the Underground Electric Railways Co. of London Ltd. In 1940 he assisted the Ministry of Aircraft Production with the construction of war factories.

We regret to record the death on September 24, in his 61st year, of Mr. A. G. Walker, B.A., M.Inst.C.E., a Managing Director of Walker Bros. (Wigan) Ltd.

G.W.R. APPOINTMENTS

The G.W.R. announces the following appointments, with effect from October 4:

Mr. M. H. B. Gilmour, Parliamentary, Rating & General Assistant to the Solicitor, to be Assistant Solicitor.

Mr. F. O. Veltom, Assistant Divisional Superintendent, Gloucester, to be Assistant Divisional Superintendent, Swansea.

Mr. D. D. Bartlett, Chief Clerk, Divisional Superintendent's Office, Bristol, to be Assistant Divisional Superintendent, Gloucester.

Mr. G. S. Hodder, Parcels Agent, Bristol, to be Chief Clerk, Divisional Superintendent's Office, Bristol.

Mr. J. E. M. Roberts, District Superintendent, Sunderland, L.N.E.R., who, as recorded in our September 17 issue, has been appointed District Superintendent, Darlington, was educated at Marlborough College, and Hertford College, Oxford, and entered the company's service in 1929. He obtained general experience in commercial and operating work in the Southern Area, and in 1932 joined the rates and charges staff of the Goods Manager's Office for that area; he was engaged on work in connection with the negotiation of agreed charges and the submission of evidence on early cases to the Railway Rates Tribunal, and subsequently on duties in connection with road-transport rates. From 1934 to



Mr. J. E. M. Roberts

Appointed District Superintendent,
Darlington, L.N.E.R.

1938 he was concerned with matters appertaining to the company's educational scheme, staff-training arrangements, and superannuation and pension funds in the Salaried Staff Section, Chief General Manager's Office, Kings Cross; he then became Chief Staff Clerk, Divisional General Manager's Office, North Eastern Area. In May, 1939, Mr. Roberts was appointed Assistant District Superintendent, York, and in October, 1941, he was made District Superintendent, Sunderland.

We regret to record the death on September 29 of Mr. John Reed, who was Secretary of the Beira Railway Co. Ltd. from 1907 to 1927.

News has been received that Lieutenant John Maltby Bland, R.E., son of Mr. E. M. Bland (formerly General Manager, Nigerian Railway), has been accidentally killed in North Africa. He was educated at Marlborough College and Peterhouse, Cambridge, where he gained his Honours degree in the Mechanical Sciences Tripos, and joined the Royal Engineers in 1941. Mr. W. Cramer Bostock writes: "It is a sad loss, as John, apart from having a charming character, was an exceptionally enthusiastic locomotive man. I think it was his first interest so far as mechanics was concerned, and had he been spared, he might well have made a name for himself in the railway world."

G.W.R. Home Guard and Civil Defence Inspection

(See article on page 367)



Major-General Lord Bridgeman taking the salute at the march past at Grangetown, Cardiff, on September 26. Also on the platform (right) are the Lord Mayor of Cardiff, Colonel K. W. C. Grand, and Sir Charles Hambro



Major-General Lord Bridgeman talking with a member of the G.W.R. Home Guard



Colonel Sir Gerald T. Bruce with members of the G.W.R. Civil Defence organisations



A contingent of G.W.R. Police who formed part of the parade



G.W.R. Home Guard units during the march past the saluting base

TRANSPORT SERVICES AND THE WAR—210

L.N.E.R. Winter Timetables

On the L.N.E.R. the winter timetables, operative from October 4, show that the daily summer relief expresses from Kings Cross at 9.15 a.m. to Newcastle, and Newcastle at 12.50 p.m. to Kings Cross, as well as the Fridays only 3.30 p.m. from Kings Cross to Newcastle and 7.15 p.m. to Aberdeen, have been withdrawn. The 12.45 p.m. from Kings Cross to Edinburgh, and the 1.10 p.m. from Edinburgh to London, both 8½ hr. trains put on on June 28 last are retained; the only alteration is that the 12.45 p.m., previously calling at Grantham, now calls at Peterborough instead (2.21-2.29 p.m.), and runs thence non-stop over the 111½ miles to York. Another of the June 28 introductions permanently continued is the 7.50 p.m. from Edinburgh to Kings Cross, with the 10.35 p.m. Newcastle sleeper preceding throughout; the latter arrives at 5.42 a.m., 28 min. earlier than in the May timetables. A stopping train now runs from Hitchin at 12 noon to Peterborough, breaking up the long gap which, except on Saturdays, has existed since the beginning of the war between 8.40 a.m. and 5.16 p.m. in the service to intermediate stations over this section of the L.N.E.R. main line; the corresponding up service is a 3.30 p.m. from Peterborough to Hitchin. There is a considerable modification of train timings on the G.E. Section, where the majority of the services suffer slight deceleration, largely in the direction of increased station times. The 11.55 a.m. and 4.45 p.m. expresses start 5 min. earlier, and reach Hunstanton 3 and 4 min. later and Norwich, in the case of the 11.55, 6 min. later; the 5.49 p.m. Norwich dining car train leaves Liverpool Street at 5.46 p.m., and is not due in Norwich (Thorpe) till 10.8 p.m., 14 min. later—a deceleration of 17 min. The 3.48 p.m. from Liverpool Street to Cambridge starts 6 min. earlier, but with unchanged arrival. On the Colchester line the 4.33 a.m. down starts 8 min. earlier; the 4.5 p.m. is slowed 12 min. to Norwich (7.30 p.m.) and 18 min. to Yarmouth (8.10 p.m.); the 5.10 p.m. to Cromer leaves at 5.6 p.m., and arrives 5 min. later, at 9.41 p.m.; and there are various other minor decelerations, as also in the up

direction. Of the cross-country services the 4.10 p.m. from Lowestoft to Peterborough leaves at 3.40 p.m., and arrives at Peterborough East at 7.35 p.m. (15 min. earlier); also the 5.45 p.m. from Colchester to Edinburgh starts at 5.25 p.m., and runs 20 min. earlier to Peterborough East. Practically all trains on the Liverpool Street-Southend service are slowed from 1 to 5 min. on their journeys.

S.R. Winter Timetables

There is to be very little modification of the Southern services during the coming winter. The summer relief trains at 10.25 a.m. and 12.18 p.m. from Exeter to Waterloo are taken off, and also the special service at 2.5 p.m. from Ilfracombe, 2.28 p.m. from Plymouth Friary, and 4.30 p.m. from Exeter to Waterloo. On the Central Section the 5.5 p.m. from Hastings to Victoria via Eastbourne and the 8.45 p.m. from Victoria to Hastings similarly disappear; a slower service in each direction at about the same hour is given via Brighton. The 10.48 p.m. from Victoria to Brighton now leaves at 11 p.m., and is correspondingly later throughout.

U.S.A. Army Transportation Corps

The Transportation Corps of the United States Army, which was established in June, 1942, has continued to expand its military railway operations in the European theatre of war, by reason of plans for future operations. It has control in the United Kingdom of many American-built goods locomotives working on main-line railways. Such units, which have already been described and illustrated in our columns, are equipped with Westinghouse and vacuum brakes so that they are capable of being used on any standard-gauge railways in Europe.

Transport of Seed Potatoes

The Minister of Food has issued Directions (dated September 17—S.R. & O. No. 1343) under the Food Transport Order, 1941, regulating the transport of seed potatoes from Scotland to England and Wales between September 26, 1943, and April 30, 1944. The purposes of these Directions, which are similar to those made last season, are to relieve the railways of traffic which may reasonably be diverted to a sea route, to ensure that the best use is made of the available rail facilities, and to make seed available in good time for planting next season's crop. The main provisions of the Directions are as follow:

1.—From September 26 to October 16, 1943, seed potatoes may be consigned from Scotland to England or Wales by any route, subject to conditions respecting the consignment of at least 6 tons of one variety to each destination and the inclusion of certain details in the railway consignment note being complied with;

2.—From October 17, 1943, to April 30, 1944, seed potatoes of any variety, other than King Edward VII, Majestic, and Doon Star, may be transported by rail from Scotland to England or Wales, subject to the conditions mentioned in (1) above and to a loading permit being obtained from the Ministry of Food;

3.—From October 17, 1943, to April 30, 1944, seed potatoes of the varieties King Edward VII, Majestic, and Doon Star may be transported from Scotland to England or Wales by a sea route, subject to certain conditions, namely, that the potatoes are in sewn-up bags; that certain details are marked on the bags; that stated particulars are entered on the consignment note; and that each consign-

ment consists of not less than 6 tons of seed of one variety for one consignee at one destination.

The Directions do not apply to seed potatoes grown in Wigtownshire, Kirkcudbrightshire, Dumfriesshire, Roxburghshire, and Berwickshire, nor to consignments of less than one ton each for any one destination.

Two days earlier, the Transport of Seed Potatoes Direction, 1943, dated September 15, 1943, was made by the Minister of War Transport. This ordered that no seed potatoes should be accepted for conveyance from any place in Scotland to any place in England or Wales, unless the railway company was satisfied that such conveyance was in accordance with a permit granted by or on behalf of the Minister of Food.

South African Blackout Relaxed

The blackout in South African coastal areas was greatly relaxed on September 20. The house blackout is now enforced only after 11 p.m., and motor-car lighting restrictions have been suspended. These relaxations have been decided on by the military authorities because of the greatly improved strategical situation.

Military Transport for South African Farmers

Military convoys have been organised in South Africa to bring in the Union's maize harvest. A scheme has been worked out by the Departments of Defence, Agriculture, and Railways, to ensure that war conditions will in no way interfere with getting in this year's crop. In the Free State and the Transvaal 36 transport camps have been established, at each of which there will be ten lorries with native army drivers and European N.C.O.s. in charge. The personnel will operate under the instructions of the local stationmasters. There will be no attempt to compete with private enterprise, and army lorries will be made available only when transport facilities are inadequate by reason of war conditions.

Railway Sabotage in Belgium

While there are obvious reasons why precise details at the time of the occurrences should not be given about the successful sabotage of the German war effort by nationals of occupied countries, information reaches the Governments in exile, and occasionally forms the basis of a statement when the issue of such may be made with prudence. In Belgium the railway services have been hampered and damaged to a consistent and widespread extent, as a result of patriot activities, and the following details are extracted from a statement made by an agency of the Belgian Government in exile. From this it would appear that Belgian patriots have paid particular attention to railway sabotage, to retard the transport of war supplies and manpower from Belgium to Germany. In Hainaut Province saboteurs derailed a train of war material, destroying part of the freight and tying up the line for three days. At Basecles, the destruction of a railway crossing tied up railway traffic for 24 hr. on the Tournai-Mons and Basecles-Valenciennes lines. Saboteurs dynamited one of the buildings of the Railroad Construction Company at Kessel-Loo, near Louvain, destroying a number of electric carriages; 15 barrels of petrol, each containing 44 gal., and a large stock of wood were set on fire. Railway tracks at Brussels were recently dynamited, and traffic over the line was held up for 36 hr. The Louvain-Mecheln line was blown up near Muysen, and two days later near Tildonck.

BLACKOUT — LOOK OUT!



*MAKE SURE THAT YOUR TRAIN IS AT A STATION BEFORE OPENING CARRIAGE DOOR.
*MAKE SURE YOUR CARRIAGE IS AT A PLATFORM BEFORE ATTEMPTING TO ALIGHT.
*MAKE SURE THAT YOU USE THE DOOR ON THE PLATFORM SIDE OF THE CARRIAGE.

BRITISH RAILWAYS
GWR · LMS · LNER · SR · LT

A recently-issued poster enjoining care on railway passengers during blackout

At Thienen, the brakes of 17 goods trains were severed.

In Hainut Province, a German patrol surprised a group of saboteurs about to blow up a rail crossing. The patriots, who were armed, threw themselves behind a small embankment and opened fire on the patrol, killing one German and wounding two others. The Germans were forced to retire and the saboteurs escaped. An even bolder act took place in the Hasselt district, Limburg. Large quantities of leather, cables, copper, footwear, and food were stolen from 20 goods wagons standing in the Hasselt Station; after several days of investigation, the Germans sentenced nine railwaymen to prison. Another damaging form of sabotage consists in removing labels from German goods wagons, resulting in much confusion and delay. German inspectors in various railway yards are forced to spend days ascertaining the contents of wagons and verifying their destinations. River traffic was recently held up for seven days following the dynamiting of the Dender Bridge at Geeraardsbergen. The Germans are trying to fight this sabotage by recruiting a special guard for rail and river traffic from among Flemish National-Socialist or Rexist workers. Large advertisements are appearing in the Nazi-controlled newspapers promising volunteers good wages, additional rations, and exemption from forced labour and deportation.

The Kenya & Uganda Railways and the War Effort

The report of the General Manager on the administration of the Kenya & Uganda Railways & Harbours for the year ended December 31, 1942, is reticent in its references to the contribution of the railways to the war effort, but it shows substantially-increased earnings, which gave a return of 7.6 per cent. on the total capital expenditure of £23,283,729, while on the interest-bearing proportion of this total (namely, £14,131,681) the return was 12.5 per cent. The report states that the time has not yet arrived when the details of the work undertaken by the administration on behalf of the Navy, Army, and Royal Air Force, and the Allies can be published in full, but the demands on the services made by the Armed Forces continued to be very heavy during the year, and the Transportation Department was again called upon to meet exceptional military requirements which, while taxing the resources of that department to the utmost, were met expeditiously and efficiently.

The flat rail rate of 8 cents a ton-mile for goods traffic of the Armed Forces introduced in 1940, continued to apply during the year, and was extended to embrace traffic carried to and from the various refugee camps which have been established. The special port handling and wharfage charges on such traffic of 5s. a harbour ton for imports, and 2-5s. a harbour ton for exports, introduced in 1940 and 1941 respectively, also continued to apply. The currency is £1 sterling, divided into 20 East African shillings; a shilling consists of 100 cents. The very heavy demands made on the Port Department during the year were met satisfactorily.

The activities of the Civil Engineering Department have covered a wide field of war work which included the provision of: 10.35 miles of sidings; 31 turnouts; 605,000 sq. ft. of shedding; and 8 miles of roadway. The mechanical workshops in Nairobi also carried out a large amount of highly skilled work for the Armed

Forces, particularly in the manufacture of equipment, etc.

Intensive Mexico—U.S.A. Traffic

So intensive is the traffic now being carried on the railway between Mexico City and Laredo that modifications have been made in the U.S.A. programme for rehabilitating Mexican main lines. On Saturday, August 7, for example, no fewer than 7,000 wagons passed along this line, carrying war exports from Mexico to the U.S.A. In order to avoid disturbing this traffic, the line has been excluded from the initial stage of the reconstruction programme (details of which were given in our March 5 issue, page 251), and the whole line from Ciudad Juarez

considerable expense and disturbance of the ballast bed will be unavoidable. Other railways have not adopted the longer plates until comparatively recent years, and, having just convinced themselves of the wisdom of the change, they must now revert to their previous practice.

"Rubber Roads" in Colombia

Colombia is building roads to open rubber-producing areas near the headwaters of the Orinoco River system. The newspaper *El Heraldo*, of Medellin, recently reported that work had been begun on a new "rubber road" to run from Villavieja, a few miles south of Bogota, to the river port of Carreno, on the border



Newly-reconstructed bridge near Belgrade, which was destroyed by the withdrawing Yugoslav troops in 1941

to Mexico City has been included instead. Under the original plans, only the section of the latter from Chihuahua to Torreon was intended for early attention. It is probable that the improved position of the Battle of the Atlantic has been one of the factors affecting this decision. Shortage of labour and material prevent all the desirable works being undertaken simultaneously, and the current flow of traffics, together with the existing state of the railways concerned, are dominant considerations.

Shorter U.S.A. Fishplates

Many changes in standard practice have been forced on American railways by the War Production Board, with a view to the conservation of materials. Among these is the ruling that 24-in. fishplates shall be standard whenever new rail is being laid. The effect of this change will be felt most severely by railways which have been laying the heavier rail sections in order to meet the increasingly heavy load and speed demands of present-day traffic. The New York Central System, for example, has used 36-in. and 38-in. fishplates for the past 50 years on the lines east of Buffalo, and on other portions of the system for over 25 years, and has carried its rail-joints on three sleepers, with the joint itself supported by the middle sleeper. Changing to 24-in. fishplates involves the use of a suspended joint, and if, when conditions return to normal, it is desired to substitute 36-in. or 38-in. plates for the shorter type, con-

between Colombia and Venezuela, where the River Meta joins the Orinoco. This important "rubber road" will extend for 512 miles. It is one of several "highways of penetration" projected for rubber-producing regions. Preparations also are being made to extend air transport for rubber-producing areas, especially in the upper Amazon Basin of Colombia. Colombia has agreed to sell its surplus rubber to the U.S.A. and to work with the United States Rubber Development Corporation in stimulating production. Health services are being provided for the rubber regions under the inter-American health and sanitation programme, in which the U.S.A. is co-operating.

Paraguayan Highway Development

Under the terms of a new road contract between the Paraguayan Government and the R. W. Hebard Company of New York, approximately \$2,000,000 is to be devoted to the construction of an arterial highway running from Asunción through the south-western section of the country, which is without railways. The recently-completed Mariscal Estigarribia road from Asunción to Villarrica has resulted in opening up areas of the country which previously had no adequate communication with the capital, and it is hoped that the projected road will perform a comparable function for south-western Paraguay, as it will pass through valuable grazing country where development should be rapid.

G.W.R. Home Guard and Civil Defence Inspection

For the second* time in railway war-time history, the Great Western Railway held a combined parade of members of its Home Guard and Civil Defence units, this time from men and women in the Monmouthshire and South and West Wales areas. This combined parade was held on "Battle of Britain" Sunday, September 26, 1943, in the sports ground belonging to Guest, Keen, Baldwins Iron & Steel Co. Ltd. at Grangetown, Cardiff.

Home Guard units from areas in South Wales as well as some 600 members of the company's Civil Defence personnel took part, and the entire parade was inspected by Major-General the Rt. Hon. Lord Bridgeman, D.S.O., M.C., Director-General, Home Guard & Territorial Army, who was accompanied by Colonel Sir Gerald T. Bruce, K.C.B., C.M.G., D.S.O., Regional Commissioner for Wales; Major-General J. G. Halsted, C.B., O.B.E., M.C., Commander, South Wales District; the Lord Mayor of Cardiff, Captain James Griffiths; Sir Charles Hambro, K.B.E., Chairman, Great Western Railway Company; and Colonel K. W. C. Grand, Group Commander, G.W.R. Home Guard. In addition, the G.W.R. directorate was represented by the Rt. Hon. Lord Davies, Sir William James Thomas, and Sir Charles Wright, K.B.E., C.B. A number of the company's Chief and Assistant Officers were also present.

The parade consisted of:—

"A" Company formed by various units of the G.W.R. Home Guard in the Cardiff Division.

"B" Company formed by various units of the G.W.R. Home Guard in the Swansea Division.

"C" Company formed by various units of the G.W.R. Home Guard in the Newport Division.

"D" Company formed by various units of the G.W.R. Home Guard in the South Wales Docks.

"E" Company formed by various units of the G.W.R. Civil Defence Personnel throughout Monmouthshire, and South and West Wales and the docks.

Preceding the general salute and inspection of the parade, a Guard of Honour was inspected by Major-General Lord Bridgeman, accompanied by Major-General Halsted and Colonel K. W. C. Grand, with Captain W. Harold Jones, who was in charge of the parade.

On completion of the general inspection, Lord Bridgeman addressed the Home Guard and Civil Defence personnel and paid high tribute to their smartness and keenness, and said that he thought there was only one compliment that was really worth paying, either to the Civil Defence or the Home Guard, and that was not to say how smart or how keen they were but simply to say that they were ready for battle.

Sir Charles Hambro thanked Lord Bridgeman and the other distinguished visitors who were present at the parade and added a special word of gratitude to Sir Charles Wright for allowing the use of the sports ground. He also paid a tribute to the magnificent work which has already been performed by the company's Civil Defence and the Home Guard personnel, despite the fact that from day to day these men were carrying on their onerous

railway duties in the face of great difficulties.

The Parade then marched past the saluting base where Major-General Lord Bridgeman took the salute.

Music during the afternoon and during the march past was provided by the Band of the 22nd Battalion Glam. Home Guard, by permission of the Major-General Commanding, H.Q. South Wales District.

(See illustrations on page 364)

Private Railways in Southern Italy

In view of the importance assumed, or likely to be assumed, by various railways in Italy as a result of the Allied invasion, it is opportune to review the positions of some of the larger systems of the southern part of that country in the light of information recently received.

The largest privately-owned railway in southern Italy (and in the whole country) is the Società Italiana per le Strade Ferrate del Mediterraneo. Particulars of the company's system were published in *The Railway Gazette* of July 9, page 51.

The second-largest private railway in southern Italy is owned by the Società

Fluorescent Lighting on the L.N.E.R.

The use of fluorescent lighting is being extended by the L.N.E.R. First Kings Cross, then York, and recently Sheffield (Victoria) Station inquiry and booking offices have been equipped with this method of illumination. Fluorescent lighting offers the nearest approach to daylight which has been achieved by artificial means.

The fluorescent lamp consists of a glass tube, 5 ft. long, internally coated with a combination of fluorescent powders, and containing gas at low pressure and a small globule of mercury, at each end of which is an electron-emitting electrode. The flow of electricity through a low pressure of mercury vapour enclosed in a glass tube normally produces a diffused blue glow which fills the tube, and comparatively little light is emitted; but a considerable amount of ultra-violet energy is radiated, which is absorbed by the glass walls of the tube. By coating the inner walls with fluorescent powder, the wavelength of the ultra-violet is changed and what before was invisible to the eye becomes visible light. This change in wavelength has been the subject of much research and is known as fluorescence.

Because each grain of powder over the 5-ft. length of tube generates light, a lamp



A photograph of the interior of the inquiry office at Victoria Station Sheffield, L.N.E.R., taken with the aid of no lighting other than that provided by the fluorescent lights suspended from the ceiling, reference to which is made in the accompanying article

Anonima Italiana per le Ferrovie del Sud-Est. The system consists of the following lines, of standard gauge:—

	Miles (approx.)
Bari—Conversano—Putignano—Taranto ...	70
Bari—Casamassima—Putignano ...	30
Marina Franca—Francavilla Fontana—Novoli—Lecce ...	65
Lecce—Maglie—Otranto ...	30
Maglie—Gagliano Leuca ...	25
Zollino—Nardo Centrale—Gallipoli ...	20
Gallipoli—Casarano ...	15
Gagliano Leuca—Casarano—Nardò Centrale ...	45
Total ...	300

The Strade Ferrate Secondarie Meridionali owns and operates the following 3 ft. 1½ in. gauge lines:—

	Miles
Naples (Corso Garibaldi)—Nola—Baiano ...	25
Naples (Corso Garibaldi)—Barra—Ottaviano—Poggioreale—Sarno ...	25
Naples (Corso Garibaldi)—Pugliano—Torre Annunziata—Castellammare Terme ...	20
Torre Annunziata—Casape—Poggioreale ...	10
Total ...	80

of low brightness practically free from glare is obtained. As the shadows are greatly diffused, it gives practically shadow-free lighting, a distinct advance over that provided by the normal tungsten-filament lamp with its highly-concentrated light source producing heavy shadows.

In wartime conditions, this type of lighting is available only for industrial use, and is made in a standardised length of 5 ft.; but lamps of nine standardised sizes, from 9 in. to 5 ft., are in use in the United States of America.

Its initial success in the industrial field indicates that, after the war, the use of this lighting will be extended. The manufacture of varying lengths of tube will provide greater flexibility in lighting installations than is possible at present. The production of coloured fluorescent-lighting, which is in the laboratory stage, already shows a striking advance over the colours previously obtained with the ordinary filament-lamp.

* The first combined parade was of London Division units. An account was given in our July 30 issue and some illustrations were published in our August 6 issue

British Railways and Fuel Economy Campaign



Sir Charles Newton (left), Major G. Lloyd George, Sir Reginald Hill, and Mr. J. Elliot, on the platform at the railway fuel conference

A conference of the principal fuel-using departments of the British railways was held in the Shareholders' Room at Euston Station, London, on September 29, under the Chairmanship of Sir James Milne, General Manager, Great Western Railway, and Chairman, General Managers' Conference. The conference was addressed by Major G. Lloyd George, Minister of Fuel & Power, and Mr. M. G. Bennett, Chairman, Railways Fuel Economy Committee.

Sir James Milne welcomed the Minister on behalf of the main-line companies and London Transport. He said that the railways were playing a vital part in the furtherance of the war effort, and it was hardly necessary for him to say that the operation of railway services was contingent on their being assured of an adequate supply of coal. The annual consumption of coal by the railways was 16,000,000 tons, and it was incumbent on them to effect economies in consumption and assist the Minister, who was dealing with one of the most difficult problems before the Government.

Mr. M. G. Bennett said that the British

railways had always practised fuel economy in their own interests. The degree of success which had attended their efforts might be gauged by the reduction in consumption of coal per engine mile between 1923 and 1938. Had there been no improvement in the 1923 figure, 600,000 tons more coal would have been needed in 1938. Had it not been for the engineering and organisational skill and experience built up by the railways for years past, the demands they were now making on the coal resources of the country would have been far greater. That skill and experience had enabled the railways to adapt the operation of their systems to wartime needs, and to provide a transport service invaluable to the war effort. Similarly, they had adapted and extended their pre-war efforts to meet the new fuel situation. In doing so, they had done things which in peacetime they would not have considered as sound commercial practice. They had cut train and waiting-room heating, had accepted inferior fuels, and had reduced their services. These were part of the common sacrifice which must

be borne by all to achieve the common aim of winning the war as soon as possible, and they looked forward to the time when they could again offer the public the highest possible standard of comfortable travel.

The key to the problem of driving trains with the least possible amount of coal was skill on the footplate, and the railways had redoubled their efforts to inculcate efficient methods of driving and firing. The pre-war practice of theoretical and practical training had been intensified, and some additional travelling inspectors and instructors had been appointed to help in this work. Engine-coal consumption data were recorded and, where desirable, brought to the attention of the men. During the first six months of this year there had been an improvement at the rate of approximately 1,000,000 tons a year.

Power stations could burn low-grade fuels efficiently provided that the quality did not change too frequently. Given consistency, the greatest opportunity for saving fuel was to be found in using less electricity. By curtailing train services the Southern Railway had reduced electricity for traction by 17 per cent., and had thus saved 50,000 tons of coal a year. The London Passenger Transport Board was saving 4,000 tons a year by reducing the lighting of stations and trains, and 600 tons a year by controlling escalator-speed according to traffic.

At the works of the Chief Mechanical Engineers improvements had been made to plant. Amongst the most effective fuel economy methods had been the insulation of hot surfaces, the utilisation of waste heat for preheating primary air to furnaces, stopping leakages of steam, compressed air, and so forth, and returning condensed steam to the boilers. A case was on record of a gas-fired furnace in which a saving of 40 per cent. was made by insulation and air preheating, and cases of 12 per cent. and 10 per cent. saving were common.

The railways had designed their engines to meet the coals most readily available, but these new diets had not been absorbed without an effort on the part of the locomotive departments to test them and to find the best way of using them, and on the part of the distributing departments to place them where they could best be used.

Self-imposed rationing schemes had enabled the railways to cut supplies of



A general view of the conference held at Euston, on September 29, of representatives of the principal fuel-using departments of the British railways

fuel to stations, offices, and so on, by 13,000 tons a year. Last year the reduction of the period during which trains were heated had been estimated to save about 30,000 tons. Railway hotels had reduced their fuel demands by more than 5,000 tons. By the use of waste wood for steam raising, one railway alone had saved 10,000 tons of coal a year.

Major Lloyd George said that the railways were one of the biggest customers of the mines; coal formed the largest bulk of the railway goods traffic. In war this relationship had grown even closer. Coal was the life-blood of the nation's war effort and the railways were the arteries along which that blood flowed. The railways had grappled with the immense problems of coal traffic that had been brought about by the war, such as the transfer from coastwise to railborne traffic, and the Minister was confident that they would solve the next problem to be thrust on them, the transport of the greatly increased output of open-cast coal to be expected next year.

The greatest shortage at the present time was of large coal and this placed a very heavy responsibility on the railways as the largest industrial user of the fuel in worst supply. The problem was the first in priority. He made two suggestions: first, a redoubling of the drive to ensure that no locomotive coal was wasted; second, that the whole of the railways' wide engineering experience should be applied to the possibility of using more of these "substitute fuels."

Sir William Wood, President, L.M.S.R., proposed a vote of thanks to Major Lloyd George, and said he had often been in the Shareholders' Room at Euston when the temperature had been higher, but never when there had been present such a representative gathering of the four railways and of London Transport. He was quite sure everyone would do what he could to assist the Minister in his campaign to reduce the consumption of fuel.

Sir Reginald Hill, Deputy Director-General, Ministry of War Transport, seconded the vote of thanks.

Those on the platform at the conference included:—

Messrs. H. Bolton (President, Electrical Trades Union), T. F. Cameron (Assistant General Manager (Works), L.N.E.R.), R. A. Riddles (Chief Stores Superintendent, L.M.S.R.), Croom Johnson (Chief Stores Superintendent, L.P.T.B.), A. Deakin (Secretary, Transport & General Workers' Union), F. W. Hawksworth (Chief Mechanical Engineer, G.W.R.), Tom Smith, M.P. (Ministry of Fuel & Power), T. Burns (President, Associated Society of Locomotive Engineers & Firemen), J. Elliot (Deputy General Manager, S.R.), Sir Reginald Hill (Ministry of War Transport), Sir William Wood (President, L.M.S.R.), Sir James Milne (Chairman, General Managers' Conference), Major Lloyd George (Minister of Fuel & Power), Sir Charles Newton (Chief General Manager, L.N.E.R.), Mr. F. J. Burrows (President, National Union of Railwaymen), Colonel Sir Alan Mount (Ministry of War Transport), Messrs. Evan Evans (Operating Manager (Railways), L.P.T.B.), A. S. Quartermaine (Chief Engineer, G.W.R.), P. T. Heady (representing Railway Clerks' Association), Colonel C. Francis (Stores Superintendent, S.R.), Messrs. J. R. Scott (representing Amalgamated Engineering Union), W. G. Nott-Bower (Ministry of Fuel & Power), M. G. Bennett (Chairman, Railways Fuel Economy Committee).

SEVENTY YEARS OF L.M.S.R. SLEEPING CARS.—Seventy years ago on October 1 the first sleeping-car train steamed out of Euston for Scotland. The upper sleeping-berths were like rigid hammocks; day seats formed lower berths for first-class passengers only. Not until 1928 did third-class sleepers appear.

Staff and Labour Matters

Engineering Wages

The National Arbitration Tribunal has had referred to it a question of interpretation of an award made last March, in regard to engineering wages which arose out of a dispute at Barrow, where 9,000 men employed by Vickers-Armstrongs Limited went on strike. The strike was not supported by the trade unions. The men claimed that the employers' interpretation of the March award was wrong and that a large number of men paid on the premium bonus system were entitled to more money. The National Arbitration Tribunal met on September 28 to consider the matter and the members were the same as those who heard the wage claim last March—Mr. Justice Simonds (Chairman), Sir John Forster, and Sir W. David Ross. They sat with two Assessors, Mr. W. O. R. Holton (for the employers) and Mr. A. M. Wall (for the unions). The case for the employers was presented by Sir Alexander Ramsay (Engineering & Allied Employers' National Federation) and that of the unions by Mr. Jack Tanner (Amalgamated Engineering Union) and Mr. Mark Hodgson (Boilermakers & Iron & Steel Shipbuilders Society). Among the points the tribunal had to consider were:—

1. In respect of workers on payment by results, was it the intention of the tribunal that subject to the proviso that piecework prices and bonus or basis times shall be such as will enable a workman of average ability to earn at least 27½ per cent. over basic time-rates as provided by the award, additional gain should not be derived from the award for equal effort?

2. Assuming that the pre-award "times allowed" are such that the man of average ability is in a position to earn 27½ per cent. or more on the new consolidated basic-rate, is it intended that payment of bonus on this basis shall be calculated on the new consolidated basic-rate without adjustment in the pre-award "times allowed"?

3. In premium bonus systems where pre-award 50 per cent. was added to the estimated time in order to obtain the time allowed and the workman receives 50 per cent. of the time saved, is it necessary to substitute 55 per cent. for 50 per cent. even in cases where the actual pre-award "times allowed" do in fact yield 27½ per cent. or over on the new consolidated basic-rate to workers of average ability?

In its award the tribunal states: "The requirements of the award in respect of workers employed on systems of 'payment-by-results' are that all the following conditions should be satisfied, namely:

1. (a) That in the case of piece-workers the piece-work prices shall be such as will enable a worker of average ability to earn at least 27½ per cent. over the new district basic time rates provided by the award.

(b) That in the case of workers on time-allowances or premium-bonus systems the bonus or basis times shall be such as will enable a workman of average ability to earn at least 27½ per cent. over the new district basic time-rates provided by the award.

2. That the worker shall receive, in addition to the payment to be made under 1 above, a national bonus at the rate of 13s. 6d. a week of 47 hr.

3. That (under paragraph 4 (4) of the award) where the inclusive rate paid under the requirements set out in 1, and 2, above would be less in the case of any particular workman than the inclusive rate at which such workman would have been remunerated for the same work before the award, the necessary adjustment in the percentage to be applied to the new basic rates or in the bonus, or basis times shall be such as to make up the deficiency.

It follows that such alterations may be made in the percentage to be applied to the new basic rates or in the bonus or basis

times as will provide rates which satisfy the above conditions."

Mr. Bevin, Minister of Labour & National Service, made a statement on October 1, reviewing the whole position, in which he said that the Government were determined to support constitutional methods of settlement of industrial questions, and the success of these methods was dependent on the maintenance of the authority of the trade unions. The matter which was in dispute had now been settled beyond doubt, and the decision of the tribunal was final and binding. The workers who were on strike were deliberately flouting their own agreements and the arbitration procedure to which, through their unions, they were parties. They were by their acts impeding the war effort and endangering the lives of British fighting men. The only honourable and proper course for the Barrow workpeople was to accept the decision of the tribunal.

Saving Rubber on the C.P.R.

Skilled craftsmen at the Angus Shops of the Canadian Pacific Railway in Montreal are making a major contribution to the war effort in reclaiming rubber from hoses used in brake and signal connections. In the short time during which the work has been proceeding five-and-a-half tons of rubber have been saved from 5,394 air hoses and 1,058 signal hoses.

The process used at the Angus Shops is a simple splicing operation, by which the good sections of worn and burst hoses are spliced to form connections which meet all safety requirements. The connection is made by cutting two good pieces from worn connections and then joining them with a malleable iron adapter fitted into one end of each section. A clamp on the outside of the hose at the point where the adapter has been inserted completes the operation. A cutter, operated by air, and having a measuring device to guarantee accuracy, and a self-locking clamp, speeds up the operation. A vise clamp holds the hose steady, and the application of lubricant ensures a clean cut. The knife blade used on the mechanical cutter has been made from an old hack-saw blade. The chief advantages of the machine are the improved results obtained from it, and the amount of labour saved.

ELECTRICAL TRANSFORMERS ORDER, 1943.

—The Board of Trade has published the Electrical Transformers Order, 1943. As from September 30, this prohibits the manufacture, except under licence, of a prescribed range of electrical transformers otherwise than in accordance with certain provisions designed mainly to ensure the use of lower-quality electrical sheet-steel, to reduce the number of sizes of transformers in the prescribed range, and to eliminate certain non-essential features. The Order does not interfere with contracts made before September 30. Copies (S.R. & O., 1943, No. 1353) are obtainable through any bookseller or direct from H.M. Stationery Office, Kingsway, W.C.2, price 1d. each.

ECONOMY OF SOFT SOLDERS.—Appendix A to B.S./STA. 7 has been issued by the British Standards Institution for the Ministry of Supply. It deals with specifications for solders, particularly from the aspect of economy in the tin content. The appendix is intended for insertion in the folder in which B.S./STA. 7 has been issued, and copies are available at 6d. each, or 3d. each for orders of twelve or more, from the Institution, 28, Victoria Street, S.W.1.

Notes and News

Clayton Dewandre Co. Ltd.—Payment of an interim dividend of 4 per cent. (same) is announced.

A Turkish Ropeway.—A ropeway, 3 miles in extent, has been constructed for the conveyance of coal from the mines to the port of Zongouidak, on the Black Sea. This installation will permit of doubling the shipments of coal from that port.

***Egyptian Delta Light Railways Limited.**—The directors have recommended the payment of a dividend of 2½ per cent., less income tax at 10s. in the £, for the year ended March 31, 1943, on the 5½ per cent. cumulative preference shares.

Technical Assistant to Chief Engineer Required.—A technical assistant to the Chief Engineer is required by the Sierra Leone Railway for one tour of 12 to 24 months, or for the duration of the war, whichever is the shorter period. Details are given in our Official Notices, on page 371.

Cunard Steamship Co. and Air Powers.—Stockholders of the Cunard Steamship Co. Ltd. at an extraordinary general meeting on September 27 unanimously approved a resolution altering the memorandum of association so as to give the directors authority to establish and operate air services. Cunard White Star Limited (a subsidiary) already possesses air powers.

Road Accidents in August, 1943.—The return issued by the Ministry of War Transport of the number of persons reported to have died, or to have been injured, as a result of road accidents in Great Britain during the month of August last shows 404 deaths (compared with 502 in August, 1942), 2,443 seriously injured (compared with 2,900 in August, 1942), and 7,064 slightly injured (compared with 8,153 in August, 1942).

State of Bahia South Western Railway Co. Ltd.—Payment is announced of 3 per cent. arrears of interest on the 8 per cent. prior lien debenture stock, plus interest at 5 per cent. per annum from due dates to date of payment. This represents the balance of 1 per cent. outstanding for the half-year to November 1, 1937, and 2 per cent. on account of the half-year to May 1, 1938, and the total payment amounts to £3 16s. 7d. per cent.

Trans-Canada Air Lines.—The amount of mail carried during July by Trans-Canada Air Lines was 316,547 lb., an increase of 7,438 lb. over that for June, and of 123,576 lb. over that for July a year ago. Passengers numbered 13,468, an increase of 852 over June, and of 4,028 over July, 1942. Express traffic during July was more than double that of a year ago, having risen from 33,323 lb. to 73,994 lb.; the increase over June was 2,371 lb.

Sheffield Steel Products Limited.—For the year to March 31, 1943, the trading profit (after provision for taxation) amounted to £105,774, which included £12,600 over-provided for E.P.T. in previous years and now brought back into the accounts. This profit compares with £75,147 for 1941-42. After crediting sundry income (£1,846) and debiting fees and debenture interest and sinking fund, there remained £80,025 which, added to £17,565 brought in, made £97,590. This enables the dividend to be raised from 5 per cent. to 7½ per cent., the appropriation to general reserve to be increased from £10,000 to £20,000, £25,000 (£25,600) to be allocated to depreciation, and £20,000 to be set aside for deferred repairs. Provision is also made

of £3,489 for additional debenture stock sinking fund. The amount to be carried forward is £22,123.

Callender's Cable & Construction Co. Ltd.—An interim dividend of 5 per cent., less tax, has been declared, the same as a year ago.

Reduction in Coal-Transit Rates in South Africa.—In accordance with the decision of the South African Minister of Transport to reduce the rail tariff on coal for local consumption (details of which were given in our August 20 issue, page 180), the Price Controller has fixed a corresponding lower maximum price for that commodity.

Hurst, Nelson & Co. Ltd.—The full report for the year to July 17, 1943, shows a trading profit of £42,207, after including income from investments and providing for taxation and deferred repairs. For the previous year the trading profit of £45,397 was arrived at before allocating £2,500 to deferred repairs. Net profit for the year under review, after providing for depreciation £5,000 (£5,200), for war damage insurance £1,627 (£2,798) and other charges, was £32,344 (£31,462), and £11,592 was brought in. The ordinary dividend is maintained at 12½ per cent., and £12,936 is to be carried forward.

Institute of Transport—Hull & District Centre.—The Council of the Institute of Transport has approved the formation of a Hull & District Centre of the Institute. It will be constituted as a sub-section of the Yorkshire Section, and there will be merged into it the activities of the Hull Traffic Association, which was founded in 1928. This Association already comprised many members of the Institute. Mr. S. Hattan, Chairman, Mr. C. H. Butler, Honorary Secretary, the other officers, and the committee of the Hull Traffic Association will become the provisional officers and committee of the new centre, pending the approval of rules. The address of the Honorary Secretary is 19, Devon Street, Cottingham, Yorkshire.

Institute of Transport Midland Section.—At luncheon meetings of the Midland Section of the Institute of Transport to be held during the 1943-44 session, a paper on "Some Possibilities for Post-War Air Transport" will be read by Sir Alan Cobham, K.B.E., A.F.C. (October 26); an address as President of the Institute will be given by Sir William V. Wood (November 19); and papers on "Random Thoughts on Transport," by Mr. D. M. Sinclair (December 21); "Some Aspects of Internal Factory Movement," by Mr. G. R. Middleton (January 25); "Education in Transport," by Mr. C. Owen Silvers (February 22); and "Some Railway Reminiscences," by Mr. E. W. T. Morris (March 22) will be read. The annual general meeting will be held on April 25. All the above meetings will take place at the Imperial Hotel, Temple Street, Birmingham, at 1 p.m.

Head, Wrightson & Co. Ltd.—Sir T. G. Wrightson, Chairman & Managing Director, in the course of his address at the 53rd annual general meeting of this company, said the firm had been built up by the enterprise of his predecessors and their colleagues, coupled with the ability and goodwill of the workpeople. Under present conditions, however, enterprise was largely limited within the narrow confines of works technique with existing plant and machinery. Plans were prepared for an expenditure of considerable plant and buildings for peacetime production and, tentatively, with regard to prospective

markets. It would be extremely important to arrange the sequence of control most carefully. He would welcome a more clearly defined lead from the Government. Without this direction those who were responsible for the conduct of individual businesses could not determine their major policies with any assurance.

Railway Membership of Dock & Harbour Authorities' Association.—The four main-line railway companies have accepted an invitation to join, in respect of their docks and harbours, the Dock & Harbour Authorities' Association, which

British and Irish Railway Stocks and Shares

Stocks	Highest 1942	Lowest 1942	Prices	
			Oct. 1, 1943	Rise/ Fall
G.W.R.				
Cons. Ord. ...	58	39	58½	—
5% Cons. Pref. ...	115½	105½	109	—
5% Red. Pref. (1950) ...	109½	103½	107	—
5% Rt. Charge ...	133½	123½	125½	—
5% Cons. Guar. ...	130½	121½	122½	—
4% Deb. ...	117	105	108½	—
4½% Deb. ...	118	108	110½	—
4½% Deb. ...	125	113	117½	—
5% Deb. ...	137	127	128½	—
2½% Deb. ...	77	70	75	—
L.M.S.R.				
Ord. ...	28½	16½	31½	—
4% Pref. (1923) ...	63½	50½	60	+ ½
4% Pref. ...	76½	67½	74	—
5% Red. Pref. (1955) ...	103½	94½	103½	—
4% Guar. ...	104½	97½	99½	—
4% Deb. ...	108½	101½	104½	+ ½
5% Red. Deb. (1952) ...	111	107½	109½	—
L.N.E.R.				
5% Pref. Ord. ...	9½	2½	9½	+ ½
Def. Ord. ...	5	1½	4½	+ ½
4% First Pref. ...	62	49½	55½	—
4% Second Pref. ...	32½	18½	31½	—
5% Red. Pref. (1955) ...	95½	79	98½	—
4% First Guar. ...	98	88	93	—
4% Second Guar. ...	90	78	81	+ ½
3% Deb. ...	85	76	81	+ ½
4% Deb. ...	106½	100½	102½	—
5% Red. Deb. (1947) ...	106	103	103½	—
4½% Sinking Fund Red. Deb. ...	106	102½	105½	—
SOUTHERN				
Pref. Ord. ...	77	61½	75½	—
Def. Ord. ...	23½	14½	24½	+ ½
5% Pref. ...	112½	104	108	+ ½
5% Red. Pref. (1964) ...	110½	105½	111½	—
5% Guar. Pref. ...	131	121½	123½	—
5% Red. Guar. Pref. (1957) ...	115½	109½	111½	—
4% Deb. ...	116	104½	107½	+ ½
5% Deb. ...	134	125½	128½	—
4% Red. Deb. (1962- 67) ...	110½	106	107½	—
4% Red. Deb. (1970- 80) ...	111	106½	107½	—
FORTH BRIDGE				
4% Deb. ...	109½	108	106	—
4% Guar. ...	105½	100	10½	—
L.P.T.B.				
4½% "A" ...	122½	111	115½	—
5% "A" ...	131½	122	123½	—
3% Guar. (1967-72) ...	95½	97½	98	—
5% "B" ...	121	111½	115½	—
5% "C" ...	56½	38	69	—
MERSEY				
Ord. ...	27½	20½	32	+ ½
3% Perp. Pref. ...	61½	56½	61	—
4% Perp. Deb. ...	102½	99½	103	—
3% Perp. Deb. ...	80½	76	77	+ ½
IRELAND BELFAST & C.D.				
Ord. ...	9	4	6	—
G. NORTHERN				
Ord. ...	29½	12½	19	+ ½
G. SOUTHERN				
Ord. ...	25	10	15½	+ ½
Pref. ...	29	12½	22	—
Guar. ...	53	35½	42½	+ ½
Deb. ...	71½	55½	67	+ ½

§ ex-dividend

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

hitherto has limited its membership to public dock, harbour, and pilotage undertakings, municipal ports, and the Manchester Ship Canal Company. A special general meeting of the Association was held in London on September 29, which formally approved the necessary alterations to the constitution and rules.

Brightside Foundry & Engineering Co. Ltd.—Net profit for the year to June 30, 1943, amounted, after taxation, to £75,246 (£72,633) and £72,445 (£47,937) was brought in. Reserve receives £25,000, against a similar amount placed to war contingencies reserve. Ordinary dividend is raised from 25 per cent. to 35 per cent., and £90,816 is carried forward.

Accident to Congressional.—We regret that the illustration appearing on page 341 of our last week's issue was described incorrectly as showing a gantry crane about to lift one of the coaches of the Congressional, of the Pennsylvania Railroad, after the recent derailment of that train. The structure above the track should have been described as a signal gantry.

Argentine Grain Surplus.—A *Yorkshire Post* special cable quotes a report by the Argentine Ministry of Agriculture that because of diminishing domestic consumption of maize it foresees the possibility of an export surplus. The Ministry also has issued revised figures for the exportable grain surplus. Wheat is now estimated at 3,680,000 tons and linseed at 644,000 tons. The previous estimate, issued on August 28, was wheat 3,740,000 tons and linseed 693,000 tons.

Croydon Airport Plan.—The plans of the Croydon Town Council for the enlargement, after the war, of Croydon Airport are on view at the town hall. It is proposed that an underground railway should connect the airport with the Southern Railway main line to London. It is stated that the Government will be asked to approve the scheme which, it is estimated, will cost several million pounds. To carry out the scheme it would be necessary to close the Brighton by-pass road running between Croydon and Purley.

Swedish State Railways Results.—Working receipts for the first three months of the current year amounted to kr. 163,800,000, which compared with kr. 150,400,000 for the same period of last year, an increase of nearly 9 per cent. Working expenditure rose very slightly to kr. 122,200,000 as against kr. 111,200,000. This included kr. 10,400,000 (kr. 9,800,000) in respect of allocation to renewal fund. The working surplus for the period under review was thus kr. 41,600,000 (kr. 39,200,000). The proportion of interest to be borne by the State Railways in respect of the State capital called for kr. 13,600,000

OVERSEAS EMPLOYMENT: A Technical Assistant to the Chief Engineer is required by the Sierra Leone Railway for one tour of 12 to 24 months or the duration of war, whichever is the shorter period. Salary: £475 × £25—£6.0 × £30—£840 a year. Free passages and quarters. Candidates must be competent draughtsmen with knowledge of the design of railway buildings and structures and of the layout of stations and goods yards. A knowledge of reinforced concrete design would be an advantage. Written applications (no interviews), giving full particulars of age, National and Armed Forces Registration numbers, qualifications, experience, and name of present employers, should be sent to The Secretary, Overseas Manpower Committee (Ref. 763), Ministry of Labour & National Service, Alexandra House, Kingsway, London, W.C.2.

(kr. 13,000,000), and there was a net profit of kr. 28,000,000 as compared with kr. 26,200,000 for the first three months of 1942.

British Continental Airways Trust Co. Ltd.—At an extraordinary general meeting of this company held at 4-6, Throgmorton Avenue, E.C.2, on September 29, a special resolution was passed that the company be wound up voluntarily.

Fodens Limited.—For the year to May 31, 1943, the profit, after depreciation, was £167,834 (£138,676), including £1,915 profit on sale of investments. Provision for taxation is £135,718 (£108,494), leaving a net profit of £32,116 (£30,182), to which is added £17,748 brought in. The dividend is maintained at 8 per cent., £1,500 (£1,000) is appropriated to war risks fund and £15,000 (same) to general reserve. The amount carried forward is £18,843.

Bolivia Railway Company.—Notice is given that the net earnings for the half-year to June 30, 1943, are sufficient to pay interest of 1.647 per cent. on the 5 per cent. mortgage and collateral trust income bonds. The balance required to enable interest of 1½ per cent. (7s. on each £20 bond) to be paid on these bonds has been provided by the Antofagasta (Chili) & Bolivia Railway Co. Ltd. A distribution is also announced of 1½ per cent. (7s. on each £20 bond) to holders of the old first mortgage bonds who have not accepted the plan of reorganisation.

British Iron & Steel Valve Manufacturers' Association.—At the recent annual general meeting of the Members of the British Iron & Steel Valve Manufacturers' Association, held at the Waldorf Hotel, London, W.C.2, and presided over by Mr O. E. Dickinson, it was decided to extend the membership of the Association to include manufacturers of non-ferrous industrial types of valves and fittings and to alter the title of the Association to the British Valve Manufacturers' Association. Non-ferrous valve-makers desirous of becoming members may obtain full particulars on application to the Secretary, Mr. H. E. Jones, 32, Victoria Street, London, S.W.1.

Practical Planning Exhibition.—How engineering science has been applied to the development of Great Britain, and the results which it could achieve in the post-war period, form the subject of an exhibition which was opened to the public at the Institution of Civil Engineers, Great George Street, London, S.W.1, on October 5. The exhibition, to which admission is free, will remain open until October 30. A series of panels displays plans, photographs, and models; those towards the end deal with specialist services, such as transport, gas and electricity, water supply, drainage, sewage, and so on. Panel No. 33, dealing

Now on Sale

Universal Directory of Railway Officials and Railway Year Book

49th Annual Edition, 1943-1944

This unique publication gives the names of all the principal railway officers throughout the world, together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

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with transport, shows maps of ancient, present-day, and proposed highway systems, also contrasting photographs of ancient and modern bridges, railway rolling-stock, and road motor-vehicles. Locomotives contrasted are the *Locomotion* and the L.M.S.R. *Coronation*.

Cable & Wireless Limited.—Announcement is made of an interim dividend of 1½ per cent. actual in respect of the year to December 31, 1943.

Canadian Pacific Railway Company.—For the month of August last gross earnings amounted to \$26,856,000, an increase of \$4,802,000 in comparison with August last year. In the working expenses of \$23,012,000 there was an advance of \$4,178,000, and the net earnings of \$3,844,000 showed an improvement of \$624,000. Aggregate gross earnings from January 1 to August 31, 1943, were \$189,731,000, an increase of \$24,718,000 in comparison with the same period of 1942, and the aggregate net earnings of \$28,977,000 were \$540,000 higher.

Sheepbridge Coal & Iron Co. Ltd.—Lieut.-Colonel Sir Henry K. Stephenson, Bt., D.S.O., Chairman, in the course of his address at the recent annual general meeting, said that the outputs of pig iron and ironstone showed marked increases on those of the previous year, and the extensions and improvements carried out at the iron-works in recent years had enabled the company to increase production in the various departments. The profit on the year's trading was £212,909, as compared with £207,531 for the previous year, and the dividend for the year was 8 per cent., free of tax. After setting aside £20,000 for renewals, etc., and adding £20,000 to the reserve fund, the balance to be carried forward was £120,096.

Contracts and Tenders

Below is given a list of orders placed recently by the Egyptian State Railways:—

Stewarts and Lloyds Limited: Tubes.
General Electric Co. Ltd.: Telephone and telegraphic materials.
Ericsson Telephones Limited: Telephone sets.
I.C.I. Metals Limited: Non-ferrous metals, cadmium copper wire.
James Hendry Limited: Belts.
Automatic Telephone & Electric Co. Ltd.: Telephone and telegraphic materials.
Standard Telephones & Cables Limited: Distortion measuring set.
British Thomson-Houston Co. Ltd.: Relay contacts.
Sentinel Waggon Works (1936) Limited: Steam valves and superheater elements.
Whitcross Co. Ltd.: Cadmium copper wire.
Holden & Brooke Limited: Spares for steam railcar gland.
Morgan Crucible Co. Ltd.: Carbon brushes.
Tuck & Co. Ltd.: Joints.

Railway Stock Market

Although there was no general increase of activity in Stock Exchange markets, the undertone has been firm. Sentiment was assisted by the small amount of selling in evidence, and by other indications of confidence in the future, including general willingness to take more than a short view. Main attention in railway securities centred on those of the Argentine companies, which were the most active section of the Stock Exchange. The rise in values reflects the more hopeful views as to the short-term outlook which have been induced by recent developments, more particularly the firmer tone adopted by the British Government in its note to the Argentine, which may aid the railway directors in negotiations with the authorities in that country, and the recent formal announcement that the increased tariffs, authorised last year, are to be continued until June, 1944. It is realised, however, that the forthcoming results of the Argentine railways for the financial year ended June last must be expected to reflect the difficult conditions under which they are operating and the need for more equitable treatment from the Argentine Government. Nevertheless, hopes of the latter appear more firmly based than was the case a few months back. Moreover, long-term prospects are viewed favourably because it is realised that the Argentine cannot fail to benefit from expansion in demand for its products which can be ex-

pected during the rehabilitation of Europe after the war. Consequently, both short-term and long-term hopes have led to an increase of speculative activity in Argentine railway securities, although it is realised that as far as the ordinary stocks are concerned, resumption of dividends must be considered as a long way ahead. Sentiment has been inclined to benefit from the knowledge that experience has shown that, after a period of depression, recovery in the earnings of the railways can make rapid progress. Debenture stocks, including those of the B.A. Gt. Southern and B.A. Western, offer apparently attractive yields and also have scope for good appreciation in price if hopes as to the outlook are realised.

Compared with a week ago, B.A. Gt. Southern ordinary has risen from 15 to 16½; the 5 per cent. preference from 28½ to 31; and the 4 per cent. debentures from 63½ to 69. During the same period, B.A. Western ordinary moved up from 14 to 15½; the 4½ per cent. preference from 27½ to 31½; and the 4 per cent. debentures from 56½ to 64. Central Argentine ordinary has risen from 9 to 10½; the 6 per cent. preference from 30 to 33; and the 4 per cent. debentures from 51½ to 56½.

The rise in Argentine railway stocks is an additional factor which may tend to draw attention to the fact that home railway junior securities appear considerably under-valued in relation to other

groups of securities. It is not contended that the rise in Argentine stocks is unjustified, but there can be no doubt that, for example, B.A. Gt. Southern ordinary at its current level of 16½ and with the dividend stage probably a long way ahead, has much smaller investment merits than, for example, Southern Railway deferred at 24, showing a yield of over 7½ per cent. on the basis of the 1½ per cent. dividend, which can reasonably be expected to continue until at least one year after the war. In other directions, Antofagasta preference has risen strongly to 48, while Leopoldina debentures at 54½ were better, as were United of Havana debentures at 36½. Moreover, San Paulo ordinary improved to 59 and Canadian Pacifics showed a better tendency.

Home railway stocks had a neglected appearance, but there was very little selling. Great Western ordinary at 59 was the same as a week ago, and the guaranteed stock was a point better; various home railway prior charges tended to respond to the improved tendency in gilt-edged. L.M.S.R. ordinary at 31½ was unchanged on balance; the 1923 preference eased to 59½, but the senior preference was better at 74. L.N.E.R. second preference at 31½ was unchanged on balance, as was the first preference at 59½. Southern deferred eased to 24; the preferred kept at 75½. London Transport "C" was fractionally better at 70.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ending	Traffic for week		No. of Weeks	Aggregate traffic to date			Shares or stock	Prices					
				Total this year	Inc. or dec. compared with 1941/2		Totals		Increase or decrease		Highest 1942	Lowest 1942	Oct. 1 1943	Yield % (See)		
							1942/3	1941/2								
South & Central America	Antofagasta (Chili) & Bolivia	834	26.9.43	£ 28,990	+	£ 1,350	39	1,088,850	818,600	+	£ 270,250	Ord. Stk.	14	7½	15	Nil
	Argentine North Eastern	753	25.9.43	14,772	+	684	13	173,976	173,706	+	270	6 p.c. Deb.	19½	10	20½	Nil
	Bolivar	174	Aug., 1943	4,508	+	718	35	41,913	35,191	+	6,722	Bonds	20½	9	21	Nil
	Brazil	...	...	...	...	...	...	...	...	...	...	Ord. Stk.	7½	4	7½	Nil
	Buenos Ayres & Pacific	2,807	25.9.43	100,800	+	6,120	13	1,053,420	1,086,360	+	32,940	Ord. Stk.	12½	7½	16½	Nil
	Buenos Ayres Great Southern	5,080	25.9.43	161,040	+	20,403	13	1,772,583	1,620,960	+	151,620	Ord. Stk.	12½	7	16½	Nil
	Buenos Ayres Western	1,930	25.9.43	54,900	+	2,940	13	604,680	623,940	+	19,260	"	12½	6	15½	Nil
	Central Argentine	3,700	25.9.43	142,209	+	17,175	13	1,613,763	1,565,673	+	48,090	"	9½	4½	10½	Nil
	Do.	...	...	...	...	...	...	...	...	...	...	Ord. Stk.	8	2½	4	Nil
	Cent. Uruguay of. M. Video	972	25.9.43	30,791	+	9,272	13	369,641	255,858	+	113,783	Ord. Stk.	16½	11	14½	Nil
	Costa Rica	262	July, 1943	23,251	+	10,490	4	23,251	12,761	+	10,490	Stk.	16½	11	14½	Nil
	Dorada	70	July, 1943	26,425	+	9,165	28	146,917	98,475	+	48,442	1 Mt. Db.	90½	89	95½	6½
	Entre Rios	806	25.9.43	22,266	+	1,650	13	248,073	228,474	+	19,596	Ord. Stk.	33	4½	7	Nil
	Great Western of Brazil	1,030	25.9.43	18,000	+	4,800	39	595,100	389,200	+	205,900	Ord. Sh.	9/-	9/-	33/9	Nil
	International of Cl. Amer.	794	Aug., 1943	\$540,396	+	\$242,201	32	\$5,025,556	\$4,308,750	+	\$716,806	1st Pref.	1½	5/3	2	Nil
	Interoceanic of Mexico	221	Aug., 1943	7,285	+	2,540	34	68,425	54,765	+	13,660	5 p.c. Deb.	11½	5	8½	Nil
	La Guaira & Caracas	1,918	25.9.43	36,743	+	3,095	39	1,308,645	1,161,688	+	146,957	Ord. Stk.	6½	3½	5½	Nil
	Leopoldina	483	21.9.43	ps. 397,200	+	ps. 173,200	11	ps. 4,743,300	ps. 3,412,100	+	ps. 1,331,200	Ord. Stk.	1	1½	1½	Nil
	Mexican	319	July, 1943	15,294	+	2,680	36	15,294	12,614	+	2,680	"	—	—	—	Nil
	Midland Uruguay	382	15.9.43	6,677	+	401	36	108,825	132,196	+	23,371	Ord. Sh.	77/	3½	78/9	Nil
	Nitrate	274	24.9.43	\$7,403,000	+	\$1,151,000	13	\$8,090,000	\$47,175,000	+	\$20,915,000	Pr. Li. Stk.	53	40	76	7½
	Paraguay Central	1,059	Aug., 1943	106,923	+	21,118	9	206,941	165,606	+	41,335	Pref.	19½	5½	15½	Nil
	Peruvian Corporation	100	July, 1943	c 108,000	+	c 29,000	1	c 108,000	c 79,000	+	c 29,000	"	—	—	—	Nil
	Salvador	153½	19.9.43	52,675	+	13,633	38	1,668,911	1,386,427	+	222,484	Ord. Stk.	59	41	58½	3½
	San Paulo	160	Aug., 1943	6,215	+	980	12	9,730	11,725	+	1,995	Ord. Sh.	41/-	23/-	28/9	Nil
	Taltal	1,301	25.9.43	53,759	+	9,301	13	621,350	495,940	+	125,410	Ord. Stk.	8½	2½	5½	Nil
	United of Havana	73	July, 1943	1,372	+	230	4	1,372	1,142	+	230	"	—	—	—	Nil
	Uruguay Northern	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Nil
Canada	Canadian Pacific	17,034	21.9.43	1,202,230	+	148,400	38	41,504,000	36,017,400	+	5,486,600	Ord. Stk.	16½	9½	15½	Nil
India	Barsi Light	202	Aug., 1943	15,285	+	2,003	22	107,055	76,587	+	30,468	"	—	—	—	Nil
	Bengal-Nagpur	3,267	July, 1943	555,725	+	17,325	17	4,184,625	3,553,425	+	631,200	Ord. Stk.	102½	88	102½	38½
	Madras & Southern Mahratta	2,939	20.6.43	277,275	+	48,250	12	2,247,340	1,768,616	+	478,724	"	105½	87	107½	63½
	South Indian	2,349	20.5.43	189,379	+	5,937	6	975,109	890,602	+	84,507	"	103½	88½	103½	4½
Various	Egyptian Delta	...	10.6.43	13,955	+	52,968	10	98,431	75,685	+	19,746	Pr. Sh.	5½	1½	2½	Nil
	Manila	...	...	...	...	...	...	...	...	...	B. Deb.	44	35	40	8½	
	Midland of W. Australia	277	31.7.1943	34,225	+	6,356	4	34,225	27,869	+	6,356	Inc. Deb.	95	90	100	6
	Nigerian	1,900	26.6.43	60,473	+	1,150	11	831,293	693,193	+	138,100	"	—	—	—	Nil
	South Africa	13,291	17.7.43	913,075	+	66,738	15	13,113,446	11,863,678	+	1,249,768	"	—	—	—	Nil
	Victoria	4,774	Mar., 1943	1,595,068	+	255,764	...	...	...	...	...	"	—	—	—	Nil

Note. Yields are based on the approximate current prices and are within a fraction of ½
† Receipts are calculated @ 1s 6d. to the rupee

Argentine traffic is given in sterling calculated @ 16½ pesos to the £
\$ ex dividend